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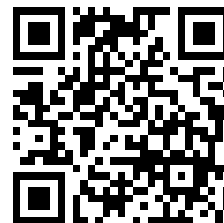


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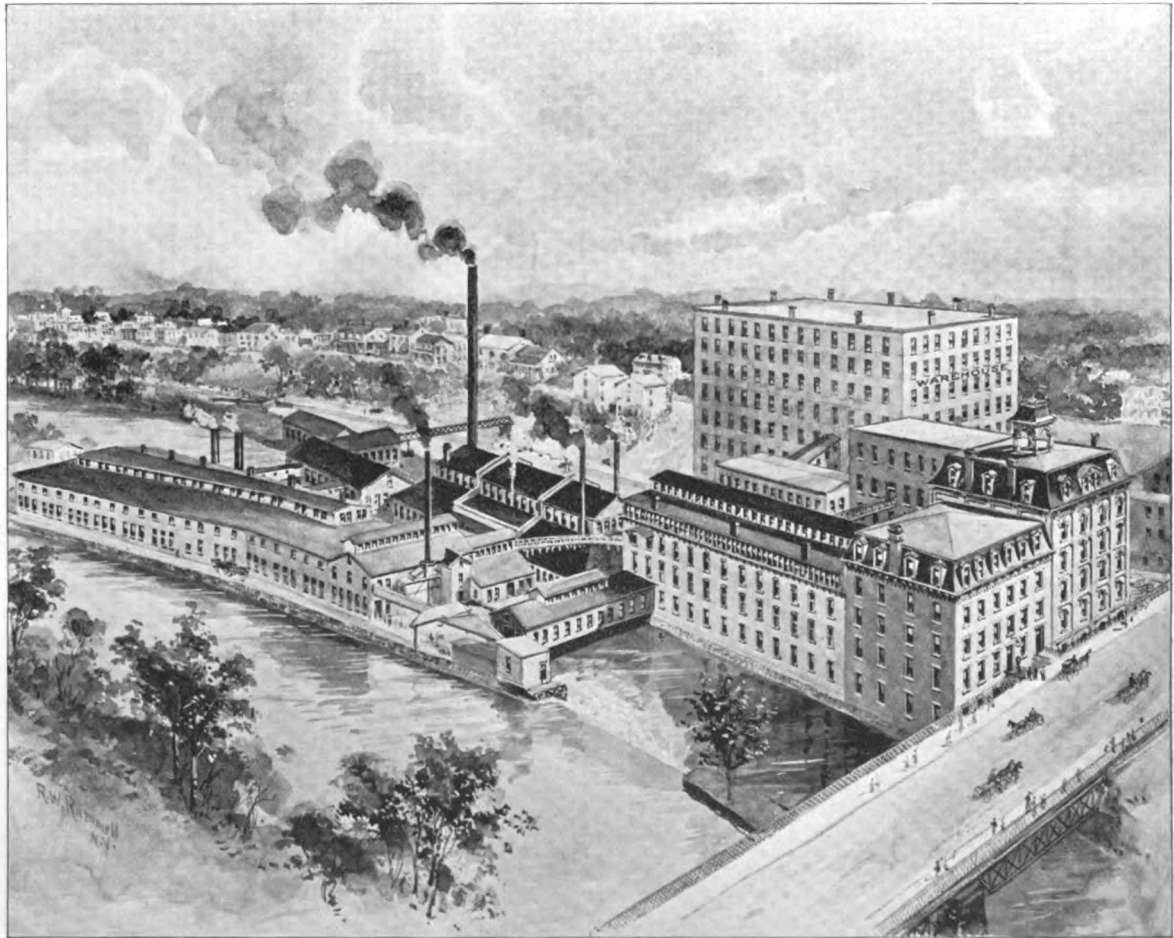
By

**THE GOULDS MANUFACTURING COMPANY,**

**SENECA FALLS, N. Y., U. S. A.**

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**ALFRED MUDGE & SON, PRINTERS,  
BOSTON, MASS.**



PARTIAL VIEW OF THE GOULDS MANUFACTURING COMPANY'S WORKS, SENECA FALLS, N. Y., U. S. A.

*Works Founded in 1848.*

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*Illustrated Catalogue and Price List*

—OF—

*Pumps and Hydraulic Machinery*

FOR EVERY SERVICE.

*Pump Supplies, Well Tools, etc.,*

MANUFACTURED BY

*The Goulds Manufacturing Co.*

*Works and Main Offices:*

*SENECA FALLS, N. Y., U. S. A.*

*Warerooms:—*

*16 MURRAY ST., NEW YORK.*

*Cable Address, "Glavis," Seneca Falls.*

*Principal Branches and Agencies:*

*THE GOULD CO., 22 and 24 North Canal Street, Chicago, Ill.*

*SMITH & WINCHESTER CO., 19 to 37 Wendell Street, Boston, Mass.*

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*N. O. NELSON MFG. CO., 8th and St. Charles Streets, St. Louis, Mo.*

*L. M. BATES, 321 Vine Street, Philadelphia, Pa.*

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MAIN OFFICES OF  
THE GOULDS MANUFACTURING CO.,  
SENECA FALLS, N. Y., U. S. A.

## ...TO THE TRADE . . . .

We are pleased to offer this complete catalogue of our manufacture of Pumps and Hydraulic Machinery for every service, Pump Supplies, Well Tools, etc. It has been our endeavor to embody in this catalogue only the most staple and best Pumps of the several classes, without unnecessary duplications of Pumps for practically the same service. The many improvements and additions to our manufacture, the illustrated applications of Pumps in operation, the complete and convenient arrangement of tables — “Sizes, Prices, etc.” — given in connection with each Pump, will bespeak our efforts to maintain the acknowledged excellence and high standard of our goods and present them in a manner fitting of their worth. In addition to this general catalogue, we publish special catalogues devoted exclusively to “Efficient Power Pumps and their Applications,” “Irrigating Pumps, Horse Powers and Appliances,” “Spray Pumps,” etc., and will cheerfully furnish same upon application.

In truth, our manufacture has increased so rapidly that these special catalogues have become necessary for the convenience of the Trade, and by their completeness and frequency of issue will be found valuable auxiliaries to a general catalogue.

Very cordially,

JAMES H. GOULD, PRESIDENT.  
SEABURY S. GOULD, VICE-PRESIDENT.  
JOSEPH J. SWABY, TREASURER.

THE GOULDS MFG. CO.

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## TERMS.

THIS PRICE LIST CANCELS all former ones conflicting with it, and is subject to change without notice.

ALL ORDERS will be filled from stock as per Catalogue unless we are expressly directed otherwise, when we are sometimes obliged to ask additional time to manufacture goods and charge for extra expense, if any, involved.

IN MAKING REFERENCE to any of our goods, either for the purpose of inquiry or in orders, always give the Fig. we have adopted in connection with each article.

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GOODS ORDERED LOOSE (not packed) to points where difference in freight between loose and packed goods will cost the consignee more than the cost of packages necessary to secure lower rate, will be packed by us at our option and packages charged at cost.

WITH INFORMATION IN HAND AS TO REQUIREMENTS and conditions of work we shall be pleased to make recommendations and estimates on any Pumping outfit, and if Pumps are properly set up and cared for will guarantee their performing all we claim for them.

ORDERS FROM STRANGERS or parties unknown to us and having no commercial rating, must be accompanied by cash or satisfactory references.

ERRORS AND OMISSIONS in this catalogue excepted.

## GENERAL CLASSIFICATION.

As an aid to those who are not familiar with our trade names or descriptive Figures of our goods, we give below a General Classification of Pumps and Supplies and the pages where found. In addition, see Alphabetical Index, pages 4 to 10, and Index to Figures, pages 350 to 356.

	PAGES
Cistern Pumps . . . . .	16 to 23
Well Lift and Force Pumps . . . . .	24 " 41
Well Pump Standards and Working Heads . . . . .	42 " 55
Wind Mill Pump Standards and Working Heads . . . . .	56 " 71
Wind Mill Force Pumps . . . . .	72 " 79
Pump Cylinders and Working Barrels . . . . .	80 " 89
Pump Supplies . . . . .	90 " 94
Deep Well Working Heads and Cylinders . . . . .	95 " 103
Irrigation Pumps and Horse Powers . . . . .	104 " 117
House Force Pumps . . . . .	118 " 136
Driving Shafts . . . . .	137 " 139
Water Lifters . . . . .	140 " 145
Double-Acting Force Pumps (House Pumps, Ship Pumps, Thresher Pumps, Etc.) . . . . .	146 " 159
Rotary Force Pumps, Fire Pumps, Etc. . . . .	160 " 175
Centrifugal Pumps . . . . .	176, 177
Power Pumps . . . . .	178 to 234
Boiler Feed Pumps . . . . .	235 " 240
Hydraulic Pressure Pumps and Air Pumps . . . . .	241 " 249
Spray Pumps and Nozzles . . . . .	250 " 263

	PAGES
Garden and Fire Engines, Hose Carts, Etc. . . . .	264 to 271
Hydraulic Rams . . . . .	272 " 276
Yard Hydrants, Street Washers, Etc. . . . .	277 " 281
Farm and Church Bells . . . . .	282
Corn Shellers . . . . .	283
Jack Screws, Press Screws, Etc. . . . .	284
Sinks, Sewer Traps, Etc. . . . .	285 to 288
Well Points . . . . .	289 " 292
Well Supplies . . . . .	293 " 306
Iron and Wood Pulleys . . . . .	307
Shafting, Hangers, Etc. . . . .	308
Wrought-Iron Pipe and Casing . . . . .	309
Cast-Iron Fittings for Wrought-Iron Pipe . . . . .	310, 311
Spiral Riveted Pipe and Fittings . . . . .	312
Fire Department Hydrant Gates, Etc. . . . .	313
Hose, Rubber, Linen, Cotton, Rubber Lined, Etc. . . . .	314, 315
Hose Couplings, Nozzles, Fittings, Etc. . . . .	316 to 318
Water Relief Valves, Gauges, Etc. . . . .	319
Gate Valves, Steam Cocks, Bibbs, Etc. . . . .	320 " 325
Oil Cups and Lubricators . . . . .	326
Pipe Tools . . . . .	327 " 330
Notes and Tables . . . . .	331 " 338
Pump Repairs . . . . .	339 " 349

# ALPHABETICAL INDEX.

	PAGE
<b>A</b> IR Chamber, Hydraulic . . . . .	93
Air Compressor, Triplex . . . . .	212
Air Compressor, Vacuum and Water Pump . . . . .	179
Air Pumps . . . . .	212, 244 to 249
Ale or Beer Pump . . . . .	243
Ammonia Pump, Duplex Hydraulic . . . . .	143
Ammonia Pump, Triplex . . . . .	208
Anti-Freezing Well Force Pumps . . . . .	30 to 41
Anti-Freezing Well Lift Pumps . . . . .	25 to 30
Anti-Freezing W. M. Force Pumps . . . . .	67, 68
Anti-Freezing W. M. Force Pump Heads . . . . .	67, 68
Artesian Steam Working Head . . . . .	103
Areas of Circles . . . . .	332
Artesian Pump Cylinder . . . . .	88, 89
Artesian Well Working Head . . . . .	71
Auger Head . . . . .	299
Augers, Well . . . . .	299

<b>B</b> AILING Pumps . . . . .	206, 207
Bamboo Extension . . . . .	263
Barrel Pump Cylinders . . . . .	113 to 115
Barrel Pumps, Rotary . . . . .	163
Barrel Spray Cart . . . . .	256
Barometric Pressure at Different Altitudes . . . . .	332
Basin Pump . . . . .	126
Basket or Strainer, for Hose . . . . .	317
Beer Pump . . . . .	243
Bells, Steel Amalgam . . . . .	282
Belt Tightener for Triplex Pump . . . . .	217

	PAGE
Bibbs, Compression and Lever Handle . . . . .	325
Bicycle Pumps . . . . .	249
Bilge Pumps . . . . .	147 to 159
Bleachery Pumps . . . . .	168 to 179, 187 to 196
Boiler Feed Pump, Triplex High Pressure . . . . .	192
Boiler Feed Pump, Triplex Power . . . . .	189, 191, 192
Boiler Feed Pumps, Hand . . . . .	236, 237
Boiler Feed Pumps, Power . . . . .	189 to 196, 237, 238
Boiler Feed Pumps, Steam . . . . .	239, 240
Boiler Tubes . . . . .	309
Brewery Pumps . . . . .	220 to 224
Brine Pump, Triplex . . . . .	209

<b>C</b> APACITIES of Different Standard Gallons of Water, 332	
Capacities, Water Lifter . . . . .	145
Capacity of Pumps, Table . . . . .	333
Capacity of Pumps at 30 Strokes per Minute, Table. . . . .	332
Capacity of Tanks and Cisterns, Table . . . . .	336
Carbon Works Pumps . . . . .	206, 207
Casing, Wrought-Iron . . . . .	309
Cellar Traps . . . . .	288
Centrifugal Pumps . . . . .	176, 177
Cess Pools . . . . .	287, 288
Cess Pool Pumps . . . . .	154
Check Valve, Brass . . . . .	323
Check Valves, Iron . . . . .	92
Chemical Pumps . . . . .	210, 211
Church Bells . . . . .	282



	PAGE
Cipher Code . . . . .	11 to 13
Circulating Pumps . . . . .	177, 187
Cistern Pumps, Description . . . . .	16, 17
Cistern Suction Pumps . . . . .	17 to 23
Cock, Air . . . . .	326
Cock, Ball . . . . .	323
Cock, Brass Corporation Stop . . . . .	323
Cock, Compression Bibb . . . . .	325
Cock, Hydrant . . . . .	323
Cock, Rain and Well Water . . . . .	323
Cock, Service, Steam and Meter . . . . .	324
Cock Spout . . . . .	93
Cock, Three-Way . . . . .	324
Coins, Values of Foreign . . . . .	338
Column Curb for Chain Pump . . . . .	283
Connection for Hose and Iron Pipe . . . . .	262
Controlling and Piping Duplex Electric House Pump, Description . . . . .	215
Corn Shellers . . . . .	283
Corner Sinks . . . . .	286
Correspondents, Note to . . . . .	1
Cotton Hose, Rubber Lined . . . . .	314
Cotton Mill Pumps . . . . .	168 to 179, 187 to 196
Cotton Press Pumps . . . . .	206, 207
Counter Shafts . . . . .	137 to 139
Coupling, Flange Faced . . . . .	308
Coupling for Hose and Iron Pipe . . . . .	262
Coupling for Wood Sucker Rod . . . . .	90, 91
Coupling, Hose . . . . .	316
Coupling, Rod . . . . .	91
Coupling, Siamese . . . . .	313
Coupling, Tubular Well . . . . .	295
Curb Block . . . . .	281
Curb Box, Adjustable . . . . .	281
Cutters, Pipe . . . . .	328
Cylinders, Pump . . . . .	80 to 89
Cylinder Shoe, Tubular Well . . . . .	295
Cylinders, Tubular Well . . . . .	293

	PAGE
DEEP Well Power Working Heads . . . . .	97 to 102
Deep Well Pumping, Description . . . . .	95
Deep Well Pump Cylinders . . . . .	82 to 89
Deep Well Pump Standards . . . . .	51 to 55
Deep Well Standards or Cylinders, Description . . . . .	42, 43
Deep Well Steam Working Head . . . . .	103
Deep Well Wind Mill Standards . . . . .	62 to 65
Derrick Pins and Irons . . . . .	303
Diaphragm Force Pump . . . . .	154
Diaphragm Suction Pumps . . . . .	155
Die Plates . . . . .	329
Die, Taper . . . . .	299
Dies and Holders . . . . .	330
Directions for Placing Deep Well Pumps . . . . .	96
Distillery Pumps . . . . .	220 to 224
Drill, Reamer and Tap . . . . .	329
Drills, Tubular Well . . . . .	296 to 299
Drip Pump, Plumbers' . . . . .	243
Drive Block . . . . .	300
Drive Caps . . . . .	300
Drive Head . . . . .	300
Drive Plate . . . . .	300
Drive Top . . . . .	302
Drive Well Points . . . . .	289 to 292
Driving Shafts . . . . .	100 to 102, 138, 139
Driving Shaft and Treble Barrel Pump . . . . .	114, 115
Duplex Electric House Pump, Description . . . . .	214

ELECTRIC Elevator Pumps . . . . .	218 to 221
Electric House Pumps . . . . .	213 to 221
Electric Mine Pumps . . . . .	225 to 227
Electric Pumps for General Service . . . . .	220 to 224
Electric Water Works Pumps . . . . .	228 to 231
Electric Water Works Pumps, San Antonio . . . . .	228, 229
Electrical Mine Pumping, Description . . . . .	226
Elevator Pumps . . . . .	216 to 224

	PAGE
Electricity for Miscellaneous Pumping, Description . . . . .	222
Engines, Garden or Fire . . . . .	264 to 270
Equalizing Pipes, Table . . . . .	334
Extension and Stop Cock . . . . .	263

<b>F</b> ARM Bells . . . . .	282
Feed Water for Boilers . . . . .	196
Feed Water Heating . . . . .	336
Feet Head of Water into Pressure per Sq. In., Table . . . . .	335
Filter Press Pump . . . . .	206
Fire Engines, Hand . . . . .	264 to 270
Fire Hose . . . . .	314
Fire Pumps, Rotary . . . . .	171 to 173
Fire Streams, Notes and Tables . . . . .	174, 175
Foot Valves and Strainers . . . . .	92
Force Pump Heads, Anti-Freezing Well . . . . .	67 to 69
Force Pumps, Double-Acting Horizontal . . . . .	147 to 151
Force Pumps, Double-Acting Railroad . . . . .	79
Force Pumps, House . . . . .	119 to 137
Force Pumps, Portable Brass . . . . .	259
Force Pumps, Rotary . . . . .	160 to 169
Force Pumps, Set Length Well . . . . .	30 to 41
Force Pumps, Two-Cylinder, Vertical, 136, 150, 156 to 158	
Force Pumps, Wind Mill . . . . .	67, 68, 72 to 79
Friction Gears . . . . .	173
Friction of Water in Pipes, Table . . . . .	334

<b>G</b> ARDEN or Fire Engines. . . . .	264 to 267
Gas Companies' Pump . . . . .	243
Gas Engine Pumps . . . . .	178 to 189
Gas or Air Pump . . . . .	244
Gas Set Pump Cylinders . . . . .	82, 84
Gas Works Pumps . . . . .	212, 246, 248
Gauges, Vacuum and Pressure . . . . .	319

	PAGE
Gears, Rule for Size and Speed . . . . .	338
Goose Neck or Spout . . . . .	93
Grabs, Tubular Well . . . . .	302
Grapple, Well . . . . .	305
Grunder Pumps . . . . .	189, 191
Guide, Roller . . . . .	91

<b>H</b> AM Curing Pump . . . . .	243
Hangers, Ceiling, Floor and Post . . . . .	308
Heads, Anti-Freezing Well Force Pumps . . . . .	67 to 69
Heads, Differential Power . . . . .	97 to 102
Heads, Well Working . . . . .	70, 71
Horse Gear and Double Barrel Pump . . . . .	117
Horse Gear and Pump Table . . . . .	116
Horse Gear Pumping Apparatus . . . . .	110 to 112
Horse Power and "Challenge" Pump . . . . .	107
Horse Power and Triplex Power Pump . . . . .	109
Horse Power Belting Will Transmit . . . . .	337
Horse Power of Pumping, Table . . . . .	335
Horse Power Transmitted by Shafting, Table . . . . .	337
Horse Powers . . . . .	108, 110, 111
Hose . . . . .	314, 315
Hose Cap . . . . .	317
Hose Carts . . . . .	271
Hose Clamp . . . . .	316
Hose Couplings . . . . .	316
Hose Coupling, Swivel . . . . .	279
Hose Nipple . . . . .	317
Hose Nozzles . . . . .	318
Hose Pipes . . . . .	318
Hose Pipe Sprinklers . . . . .	317
Hose Reducers . . . . .	317
Hose Spanner . . . . .	317
Hose Straps . . . . .	316
Hose Valves . . . . .	320
House Force Pumps . . . . .	119 to 137

	PAGE
House Force Pumps, Description . . . . .	118, 146
Hydrant Gates . . . . .	313
Hydrant, Yard . . . . .	278 to 281
Hydraulic Elevator Pumps . . . . .	218, 221
Hydraulic Pressure Pump, Triplex . . . . .	207
Hydraulic Rams . . . . .	272 to 276
Hydraulic Rams, Description . . . . .	272 to 275
Hydraulic Test Pumps . . . . .	241, 242

ICE Plant Pumps . . . . .	143, 187, 189, 208, 209
Irrigating Pumps . . . . .	107 to 117, 181
Irrigation by Pumping, Description . . . . .	104, 105, 180
Irrigation Pump Cylinder . . . . .	87
Irrigation Table . . . . .	106

JACK Screws . . . . .	284
-----------------------	-----

KNAPSACK Spray Pump . . . . .	258
-------------------------------	-----

LEAD Pipe and Sheet Lead . . . . .	306
Lead Works Pumps . . . . .	206, 207
Leathers, Valve . . . . .	81, 295
Leathers, Valve and Plunger . . . . .	81
Linen Hose . . . . .	314
Lubricators . . . . .	326

MANUAL or Power Pumping Apparatus . . . . .	53 to 55
Measures and Weights, Table . . . . .	338
Metallic Lower Valves . . . . .	81
Mill Pumps . . . . .	168 to 179, 187 to 196
Mine Pumps . . . . .	225 to 227
Molasses Pump . . . . .	21

	PAGE
NOTES on Pumps and Hydraulic Machinery . . . . .	14, 15
Nozzles, Hose . . . . .	318
Nozzles, Spray . . . . .	260 to 263

OIL Cups . . . . .	326
Oil Engine Pumps . . . . .	178 to 189
Oilers, Sight Feed . . . . .	326
Oil Hose . . . . .	315
Oil Refinery Pumps . . . . .	168, 187, 189, 206

PACKING Box Heads . . . . .	70
Packings, Leather Ring . . . . .	81
Paper and Pulp Mill Pumps . . . . .	187 to 207
Pillow Block . . . . .	308
Pipe Coupling with Guide . . . . .	91
Pipe Cutters . . . . .	328
Pipe Fittings . . . . .	310 to 312
Pipe Dog . . . . .	304
Pipe Drifts . . . . .	299
Pipe Extension and Stop Cock . . . . .	263
Pipe Grapple . . . . .	304
Pipe Lifter and Holder . . . . .	304
Pipe Lifting Clevis . . . . .	301
Pipe Puller . . . . .	303
Pipe Reamer . . . . .	302
Pipe Saddle . . . . .	94
Pipe, Spiral Riveted . . . . .	312
Pipe Wrenches . . . . .	327, 328
Pipe, Wrought-Iron . . . . .	309
Pipe Tongs . . . . .	327
Piping Triplex Power Boiler Feed Pump . . . . .	193 to 195
Piping Triplex Power Pumps . . . . .	184, 185
Piping Water Lifters . . . . .	144
Pistons, Cylinder . . . . .	80

	PAGE
Pitcher Spout Pumps, Description . . . . .	16, 17
Pitcher Spout Suction Pumps . . . . .	21 to 23
Plumbers' Brass Force Pumps . . . . .	242
Plungers for Pump Cylinders . . . . .	80
Plunger Leathers . . . . .	81
Points, Drive and Tubular Well . . . . .	289 to 292
Point Extension . . . . .	290
Pole Slip or Jar . . . . .	305
Portable Brass Force Pump . . . . .	259
Power Force Pumps . . . . .	178 to 235
Power Pumps Triplex . . . . .	181 to 231
Power Rotary Pumps . . . . .	164, 168 to 173
Power to Operate Triplex Pumps . . . . .	232
Power Water Lifter . . . . .	145
Power Working Heads or Apparatus . . . . .	53 to 55, 95 to 102
Press Screws . . . . .	284
Pressure Gauge . . . . .	319
Pressure per square inch into Feet Head of Water, Table, 335	
Proving Pump . . . . .	244
Pulley Blocks . . . . .	302
Pulley Hooks . . . . .	303
Pulleys, Iron . . . . .	307
Pulleys, Rule for Size and Speed . . . . .	338
Pulleys, Wood Split . . . . .	307
Pump Stock and Die . . . . .	330

RAM, Hydraulic . . . . .	272 to 276
Railroad Double-Acting Force Pumps . . . . .	78, 79
Rate of Suction and Discharge in Pumps . . . . .	183
Reamer, Gas Pipe . . . . .	329
Regulator, Force Pump Head . . . . .	69
Regulator Force Pump Head, Description . . . . .	65
Repairs, Pump . . . . .	339, 349
Road Cart Pump . . . . .	248
Rod, Valve for Artesian Pump . . . . .	90
Rod Couplings . . . . .	90, 91

	PAGE
Rod Guide Roller . . . . .	91
Rod Joint . . . . .	91
Rod Lifter . . . . .	304
Rod Packing for Drill Rods . . . . .	303
Rod, Wood Sucker and Coupling . . . . .	90
Roller Guide and Coupling . . . . .	91
Rope Hook . . . . .	304
Rope, Well and Hoisting . . . . .	306
Rotary Barrel Pumps . . . . .	163
Rotary Fire Pump, Description . . . . .	170
Rotary Fire Pumps . . . . .	170 to 173
Rotary Force Pumps . . . . .	160 to 169
Rotary Pumps, Description . . . . .	160, 167
Rubber Hose . . . . .	314, 315
Rubber Tubing . . . . .	315
Rubbers, Valve . . . . .	295

SAND Bucket or Pump . . . . .	295
Sand Catcher . . . . .	298
Sand Pump and Drill Combined . . . . .	298
School Bells . . . . .	282
Screws, Jack . . . . .	284
Screws, Press . . . . .	284
Semi-Rotary "Clock" Force Pumps . . . . .	165, 166
Semi-Rotary "Clock" Spray Pumps . . . . .	255
Set Length Well Pumps . . . . .	25 to 41
Sewage Pumps . . . . .	154, 176, 177, 211
Sewer Traps . . . . .	287
Shafting, Steel . . . . .	308
Shallow Well Pump Cylinders . . . . .	82, 84, 87
Sheet Brass, Perforated . . . . .	292
Ship Pumps . . . . .	147 to 159
Ship Pumps, Description . . . . .	146
Siamese Connection . . . . .	263
Siamese Couplings . . . . .	313
Single Barrel Pump . . . . .	113



	PAGE
Sinks . . . . .	285, 286
Sink Bolts . . . . .	288
Sink Brackets . . . . .	285
Sink Couplings . . . . .	288
Sink Strainer . . . . .	288
Slide, W. M. . . . .	94
Slop Sinks . . . . .	286, 287
Soap Pumps . . . . .	205
Spout, Cock . . . . .	93
Spout or Goose Neck . . . . .	93
Spray Cart, Barrel . . . . .	256
Spray Hose . . . . .	314
Spray Nozzles . . . . .	260 to 262
Spray Pumps . . . . .	250 to 259
Spray Pumps, Description . . . . .	250, 251
Spray Stop Cock . . . . .	262
Sprinklers, Hose Pipe . . . . .	317
Standards, Well Pump . . . . .	42 to 55
Standards, Wind Mill Pump . . . . .	59 to 65
Steam Boiler Feed Pump . . . . .	239, 240
Steam Hose . . . . .	315
Steam Working Heads . . . . .	103
Steel, Special Cast . . . . .	306
Stocks and Dies . . . . .	329, 330
Stops, Brass . . . . .	323
Stops, Brass, Lever Handle . . . . .	325
Stop Cock, Spray . . . . .	262
Stop Cock, Brass, Corporation . . . . .	323
Stop, Compression . . . . .	325
Strainer or Basket for Hose . . . . .	317
Strainers for Suction Pipe . . . . .	92, 263, 317
Stuff Pumps, Triplex Power . . . . .	205
Stuff Pumps in Paper Mills, Description . . . . .	204
Sucker Rod and Coupling, Wood . . . . .	90
Suction Hose . . . . .	315
Suction Pumps for Paper Machines . . . . .	197
Suction Pumps for Paper Machines . . . . .	198 to 203
Sugar Refining Pumps . . . . .	198 to 205

	PAGE
Swivel, Chain and Hand . . . . .	305
Swivel Elbow Union . . . . .	143
Swivel Hose Coupling . . . . .	279
Swivel for Tubular Wells . . . . .	301

TABLES, Capacity of Pumps operated by Windmills, 58	
Tannery Pumps . . . . .	168, 176, 177, 181, 187
Tank Float . . . . .	295
Tank Switch, Electric . . . . .	215
Tank Valve . . . . .	94
Taps, Gas Pipe . . . . .	329
Taps, Taper . . . . .	299
Terms . . . . .	1
Tests of Triplex Electric Power Pumps . . . . .	233
Test Pumps, Hydraulic . . . . .	241, 242
Thresher Tank Pump . . . . .	150
Tile Setter . . . . .	305
Tobacco Press Pumps . . . . .	206, 207
Tongs, Lifting or Holding . . . . .	302
Tongs, Pipe . . . . .	327
Tongs, Sliding or Friction . . . . .	302
Treble Barrel Pump . . . . .	114, 115
Triplex Grinder Pump, Description . . . . .	188
Triplex High Pressure Boiler Feed Pump, Description . . . . .	190
Triplex Power Pump, Description . . . . .	182
Triplex Power Pumps for Fire Protection, Description . . . . .	234
Triplex Pumps for Hydraulic Elevator, Description, . . . . .	218, 219
Triplex Tank Pump, Description . . . . .	186
Tubular Well Cylinders . . . . .	293
Tubular Well Cylinder Shoe . . . . .	295, 300
Tubular Well Jar . . . . .	300
Tubular Well Points . . . . .	289 to 291
Tubular Well Valves . . . . .	294
Two-Cylinder Force Pumps . . . . .	136, 150, 156 to 158

	PAGE
UNDERWRITERS Fire Pumps . . . . .	170 to 173

VACUUM Pumps . . . . .	179, 198 to 203, 246
Valve, Horizontal Check . . . . .	92
Valve, Iron, Check . . . . .	92
Valve Leathers and Rubbers . . . . .	81, 295
Valve, Lever Safety . . . . .	319
Valve, Metallic Lower . . . . .	81
Valve Rod for Artesian Well . . . . .	90
Valve, Tubular Well . . . . .	294
Valve, Water Relief . . . . .	319
Valves, Blind or Check . . . . .	301
Valves, Brass, Angle, Globe and Hose . . . . .	322
Valves, Brass, Check . . . . .	323
Valves, Gate . . . . .	320, 321
Valves, Lunkenheimer, Brass . . . . .	321
Valves, Tank . . . . .	94
Village Fire Engines . . . . .	268 to 270
Vises, Pipe and Bench . . . . .	330

WALL Box . . . . .	308
Washer, Street . . . . .	278 to 281
Water Lifters . . . . .	141, 142
Water Lifters, Description . . . . .	140
Water Supply Pump, Triplex . . . . .	187
Waterworks, Electric Light and Power, Description . . . . .	213
Waterworks Pumps, Triplex . . . . .	230, 231
Weight of Different Standard Gallons of Water . . . . .	332
Weights and Measures, Tables . . . . .	338

	PAGE
Weirs, Table of Discharge . . . . .	106
Well Force Pumps, Anti-Freezing . . . . .	30 to 41
Well Force Pump Heads, Anti-Freezing . . . . .	67, 68
Well Force Pumps, W. M. . . . .	72 to 79
Well Frame and Double Barrel Pump . . . . .	116
Well Lift Pumps, Anti-Freezing . . . . .	25 to 30
Well Points . . . . .	289 to 292
Well Pump Standards . . . . .	42 to 55
Well Pump Standards, W. M. . . . .	59 to 65
Well Working Heads, W. M. . . . .	70, 71
Well Pump Working Heads . . . . .	53 to 55
Well Pumps, Description . . . . .	16, 17
Wind Mill Connecting Slide . . . . .	94
Wind Mill Force Pumps . . . . .	67, 68, 72 to 79
Wind Mill Forked Rod . . . . .	94
Wind Mills, Horse Power of . . . . .	57
Wind Mill Pump Cylinders . . . . .	85 to 89
Wind Mill Pump Standards . . . . .	59 to 65
Wind Mill Pumps, Description . . . . .	56 to 58
Wind Mill Regulator Force Pump Head . . . . .	69
Wind Mill Working Heads . . . . .	67 to 71
Wire Cloth, Brass . . . . .	292
Wood Pump Cylinders . . . . .	83
Woolen Mill Pumps . . . . .	168 to 179, 187 to 196
Working Barrels or Cylinders . . . . .	80 to 89
Working Heads, Power . . . . .	97 to 102
Working Heads, Steam . . . . .	103
Working Heads, Well Pump . . . . .	53 to 55
Working Heads, Wind Mill . . . . .	67 to 71
Wrench, Pipe . . . . .	327
Wrenches, Hose . . . . .	317
Wrought-Iron Pipe, Dimensions, Weight, etc. . . . .	336

# TELEGRAPHIC CIPHER CODE

Wishing to give our correspondents every facility for transmitting telegraphic or cable inquiries, orders, etc., at the least possible expense, we have adopted the following expressions, with cipher words opposite. We have arranged these expressions in alphabetical order, rather than in groups, thinking that this would be the greatest convenience to our patrons. In our catalogue, you will notice we have opposite each style and size of Pump a cypher word which can be used to designate any particular Pump or size of Pump to which you may desire to call our attention. It is always necessary in writing cipher messages to be very careful and begin each word with a capital letter and also see that they are written very plainly.

---

At what price and how soon can you furnish — ?.....	SHOW.
Await letter — giving full particulars.....	SWIM.
Cancel order —. Will write particulars.....	SIGNAL.
Cable received, will ship immediately.....	STATEMO.
Cable received, will ship in about a week.....	STATENU.
Delay shipping order —, have written.....	SHOER.
Do not fail to see — at — whose inquiry of recent date seems of importance.....	TUNIC.
Draw at 60 days sight.....	SOUND.
Draw at 90 days sight.....	SOUP.
Draw at sight with bill of lading attached.....	SOUL.
Duplicate our order — inst.....	SHIRLER.
Enter order for — and ship as soon as possible.....	SILLER.
Give preference over all others to order —.....	SIEVE.

## CODE — Continued.

Have important inquiry from —— at ——. When will you be there? Advise where to write you direct in regard to same.....	TUNNY.
Have order for ——. How soon can you ship?.....	SIZER.
Have you shipped us any —— ? Stock is very much reduced.....	SHORER.
Have sent you important communications to-day, which you should receive before going any further with order ——.....	SKATER.
Have you in stock for immediate shipment.....	SIGH.
Make and hold for shipping instructions.....	SIGHING.
Our lowest price net, boxing extra, is \$ —— .....	STATEOP.
Our lowest price net, boxing free, is \$ ——.....	STATEUS.
Please reply immediately by telegram.....	SITE.
Prepare for immediate shipment against receipt of letter this day.....	TUP.
Quote lowest price by wire on —— .....	SHOWER.
Ship via Steamer.....	SEdge.
Ship via Sailing Vessel.....	SEEK.
Ship at once by Railroad.....	SEER.
Ship at once by Express.....	SEINE.
Suspend work on order —— until further advised.....	SKATE.
Ship by Steamer via Liverpool.....	STATEVL.
Ship by Steamer to London direct .....	STATEWO.
Ship by Steamer to Antwerp direct .....	STATEXD.
Telegraph when you will ship our order —— .....	SKIFFEX.
The goods ordered —— must be here on or before —— in order to catch steamer.....	SIGHIER.
The highest additional discount we can give you beyond sheet \$ —— is ——%.....	STATIBS.
The highest discount we can give is —— % .....	STATICO.
Will you accept order for —— at —— % discount from list? .....	STATIDU.
Will you accept order for —— at \$ —— net, boxing extra?.....	STATIEL.
Will you accept order for —— at \$ —— net, boxing included?.....	STATIFO.

# CODE — Continued.

Will you give an additional discount of — % beyond sheet \$ —, on miscellaneous order, netting about \$ — ? .....	STAUB.
We have already given you our lowest quotations, and cannot reduce them .....	STAUCK.
We do not understand the — word of cable .....	STAUDOT.
25% discount from list. ....	STAUDUP.
30%     "     "     "     " .....	STAUDVG.
25/10%     "     "     "     " .....	STAUDWT.
35%     "     "     "     " .....	STAUDXA.
35/5%     "     "     "     " .....	STAUELS.
40%     "     "     "     " .....	STAUENG.
40/5%     "     "     "     " .....	STAUENO.
45%     "     "     "     " .....	STUFGA.
40/10%     "     "     "     " .....	STUFHE.
50%     "     "     "     " .....	STUFIL.
50/5%     "     "     "     " .....	STUFJG.
55%     "     "     "     " .....	STUFKA.
55/5%     "     "     "     " .....	STUFLY.
55/10%     "     "     "     " .....	STUFME.
60%     "     "     "     " .....	STUFNO.
60/5%     "     "     "     " .....	STUFOB.
60/10%     "     "     "     " .....	STUFPA.
65%     "     "     "     " .....	STUFQU.
65/5%     "     "     "     " .....	STUFRT.
65/10%     "     "     "     " .....	STUFSO.
70%     "     "     "     " .....	STUFTX.
70/5%     "     "     "     " .....	STUFUS.
70/10%     "     "     "     " .....	SUGAR.
75%     "     "     "     " .....	SUIT.

# USEFUL NOTES

## ON

### PUMPS AND HYDRAULIC MACHINERY.

There are certain conditions requisite to the successful operation of any Pumps — these factors are briefly :

**SUCTION PIPE.**—This is the pipe below the lower valves, whether the valves are in the Pump itself or in the cylinder a number of feet below the Pump (yet above the surface of the water), and in practical working should not exceed twenty-five feet in vertical height at sea level, and proportionately less at higher levels. In the following Table will be found the Barometric Pressures at different altitudes with equivalent Feet Head of Water and the Practical Suction Lifts of Pumps. This pipe may, however, extend almost any distance horizontally, if care is taken that it fall evenly along its entire length from Pump or Cylinder to water supply. In this connection, as well as in long vertical suction pipes, we urge the use of a foot or check valve, provided pipe is protected from frost, as it retains water when Pump is not in use. Properly, the suction pipe of Single-Acting Cylinders and Pumps should be half the diameter of working barrel, and in long pipes, or with Pumps working fast, it may be increased, as is also true of Double-Acting Pumps.

The following may be laid down as a safe rule for suction pipe :

#### SIZE OF PUMP BARREL OR CYLINDER.

Size of cylinder . . .	2 in.	2½ in.	3 in.	3½ in.	4 in.	5 in.	6 in.
Size of suction . . .	1¼ in.	1½ in.	1½ in.	2 in.	2½ in.	3 in.	4 in.

These sizes hold good for Double Barrel Pumps, as each barrel draws alternately. Turns or elbows should be avoided as far as possible. *Suction pipes must always be air tight.*

**CONNECTING OR DELIVERY PIPES.**—The first term is applied only to pipe between Pump Standard and Lower Barrel or Cylinder, and the last to same pipe as well, but more especially to describe pipe carrying water beyond Pump to any point. These pipes in Single-Acting Pumps may be a trifle smaller than suction pipe. In Double-Acting Pumps they should be same size, and care should be exercised that both are amply large.

Altitude.	Barometric Pressure.	Equivalent Head of Water.	Practical Suction Lift of Pumps.	Altitude.
Sea level.	14.70 lbs. per sq. in.	33.95 feet.	25 feet.	Sea level.
¼ mile (1,320 ft.) above sea level.	14.02 " "	32.38 " "	24 " "	¼ mile (1,320 ft.) above sea level.
½ " (2,640 ft.) " "	13.33 " "	30.79 " "	23 " "	½ " (2,640 ft.) " "
¾ " (3,960 ft.) " "	12.66 " "	29.24 " "	21 " "	¾ " (3,960 ft.) " "
1 " (5,280 ft.) " "	12.02 " "	27.76 " "	20 " "	1 " (5,280 ft.) " "
1¼ " (6,600 ft.) " "	11.42 " "	26.38 " "	19 " "	1¼ " (6,600 ft.) " "
1½ " (7,920 ft.) " "	10.88 " "	25.13 " "	18 " "	1½ " (7,920 ft.) " "
2 " (10,560 ft.) " "	9.88 " "	22.82 " "	17 " "	2 " (10,560 ft.) " "

**HOT WATER.** — No Pump will draft hot liquids any distance for the reason that the vapor or steam rising from the liquid passes through the suction pipe into the Pump and fills it with vapor instead of water. Therefore, for pumping hot liquids, the Pump should be placed as near supply as practicable, or better, under flooded suction, forcing the liquid upward instead of lifting it by suction. A hot-water Pump always requires metal valves throughout, and should be so ordered.

**POWER.** — Power is measured by the work performed. A gallon of water weighs about eight and one-half pounds. Therefore, if a Pump is passing ten gallons of water per minute, and lifting it one foot, eighty-five foot pounds per minute of power will be required to do it; lifting it twenty feet, twenty times eighty-five pounds, and so on.

A nominal horse-power means the power required to lift 33,000 pounds one foot in one minute, although actual experience proves that an ordinary horse working continuously will not develop nearly this power and probably 25,000 pounds is a nearer estimate. The power of a man working continuously is variously estimated at from one-fifth to one-eighth that of a horse, but think the latter figure a safer one than the former.

We give among *last pages* of this book a few concise rules for computing power necessary to raise any quantity of water any distance.

**CAPACITY.** — In connection with each Pump will be found its diameter and length of stroke, together with the gallons or decimal parts of a gallon it will pass per stroke of revolution (a double stroke); and to ascertain the number of gallons per minute delivered, multiply this quantity by the number of strokes or revolutions the Pump is working.

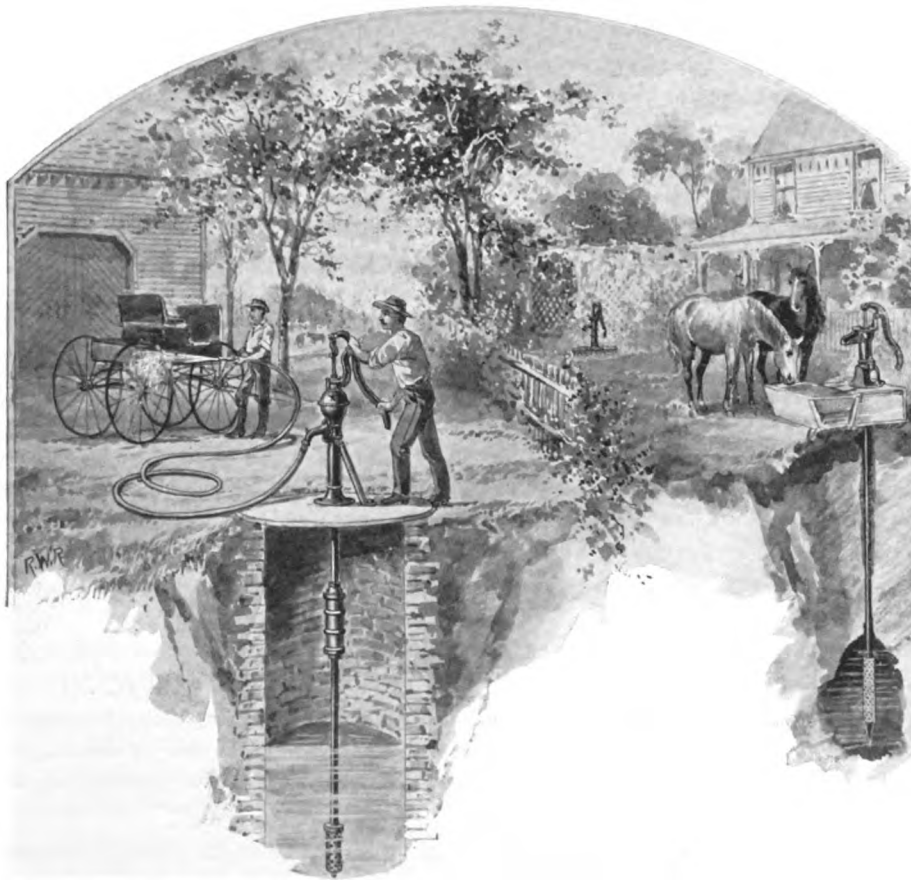
We refer to latter pages for comprehensive tables of capacity per stroke of pump cylinders of different diameters and strokes.

In Pumps worked by hand, allowance should be made for the fact that they are rarely, if ever, worked to their full stroke, and of course, cannot give full rated capacity.

**LIFT AND FORCE.** — In connection with each Pump we give approximate or safe working limit (feet head of water or equivalent pressure) to which Pumps are adapted. While there are many factors, such as time of service, care and condition of Pumps which cannot be estimated or considered, we think our recommendations will generally answer a perplexing question.

**ESTIMATES.** — We are always glad to give our customers the benefit of our advice on all practical questions relating to Pumps, and while requirements of each may be different in detail, as a general rule we should be advised on the following points: Depth and diameter of well, pit or stream; depth of water in well, pit or stream; height to which water is to be raised, that is, from surface of water to point of delivery or working pressure; quantity required in a given time; power available or preferred.

*See pages 331 to 333 for Tables of Pump Capacities, Power, Speed, etc., together with rules for estimating same.*



Cistern Pumps, Pitcher Spout Pumps and Well Pumps are perhaps the best known and in more general use than any other class.

We shall not attempt to describe all their uses, for they are too well understood to require it. Our illustration will almost explain itself.

The Cistern Pump is shown placed over a cistern near the house, although it is perhaps more often situated under cover, especially in cold climates.

The Pitcher Spout Pump is largely used for the same purposes as the Cistern Pump and in addition, is many times used in warm climates over shallow dug or driven wells. Our sketch shows the latter.

These Pumps can be used in any place where the water is not more than 25 feet below Pump, although suction pipe may be extended almost any distance horizontally.

The Well Force Pump, shown in operation, is but one of our many styles of Lift and Force Pumps which can be adapted, by changing style and location of Cylinder, for dug, driven or drilled wells from 25 to 50 feet deep.



They are commonly placed over shallow wells not exceeding 30 feet depth, with suction pipe extending below Cylinder to water. When Cylinders are not placed in the water, we advise the use of a Foot Valve at the end of suction pipe as it keeps this part filled with water, which can be discharged at the spout with one or two strokes of the pump lever. All of this class of Pumps are rendered anti-freezing by drilling a small drip hole just above Cylinder, but below frost line. This class of Pumps is fully described, pages 17 to 41.

## GOULDS CISTERN SUCTION PUMP.

WITH REVOLVING BEARER TOP AND SCREW BASE.

Fig. 198, represented by cut, is one of our Cistern Suction Pumps. Revolving bearer top permits lever to be used in any desired position. The cylinder screws on outside of base. Brass suction tube is threaded to take wrought-iron pipe coupling, if gas-pipe is used, or cast-iron nut with brass tube, if lead pipe is used. Fitted for either lead or wrought-iron pipe, or both, as ordered.

FIG. 198. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction fitted for.	Lift.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	5 in.	.07 gal.	1 in. pipe.	25 ft.	Abet	\$3.50	Brisket	\$5.50	Vicarib	\$7.75
1	2 1/4 "	6 "	.10 "	1 "	25 "	Able	4.00	Briskly	6.00	Vicarag	8.75
2	2 1/2 "	6 "	.13 "	1 1/4 "	25 "	Ablush	4.50	Brisknes	7.00	Vicela	10.50
3	2 3/4 "	6 "	.15 "	1 1/2 "	25 "	Abut	5.00	Bristle	8.00	Viceroy	14.00
4	3 "	6 "	.18 "	1 3/4 "	25 "	Ace	5.50	Bristln	10.00	Viciate	17.00
5	3 1/4 "	6 "	.22 "	1 3/4 "	25 "	Ached	6.50	Brisure	13.00	Vicinag	21.00
6	3 1/2 "	6 "	.25 "	1 3/4 or 2 "	25 "	Acid	8.00	Britanni	18.00	Vicinal	27.00
8	4 "	6 "	.33 "	2 in.	25 "	Acme	10.00	Brite	25.00	Vicinit	35.00



FIG. 198.

Brass Cylinder Pumps have brass plungers. The Brass Pumps have all parts brass except lever, bearer and base. We can fit any of our Cistern Pumps with brass lower valves and metal plunger to adapt them for hot water, at extra prices given below :—

No. 0.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 8.
\$1.00	\$1.00	\$1.00	\$1.00	\$1.25	\$1.50	\$1.50	\$1.75

We can pack in an ordinary hogshead or cask about the following number of this and similar Pumps, according to sizes :—

No. 0.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 8.
40	36	32	24	20	15	12	10

# GOULDS CISTERN SUCTION PUMP.

WITH REVOLVING BEARER TOP AND BOLTED BASE.

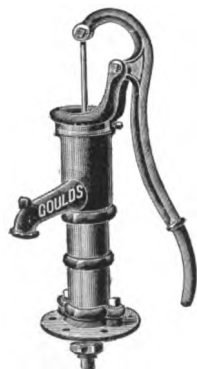


FIG. 199.

Fig. 199 is another popular style of Cistern Pump. The lever can be turned to any convenient position. The valve seat is formed by brass tube and flange, and the end of tube threaded to take wrought-iron pipe coupling if gas pipe is used or cast-iron nut with brass tube is supplied, if lead pipe is used. Will fit for lead or wrought-iron pipe, as ordered.

To prevent freezing, trip the lower valve by raising lever to extreme height, thus allowing water to leave cylinder.

FIG. 199. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	5 in.	.07 gal.	1 in. pipe.	25 ft.	Acrue	\$3.50	Vicious	\$5.50	Viduity	\$7.75
1	2 1/4 "	6 "	.10 "	1 "	25 "	Actal	4.00	Vicount	6.00	Vieary	8.75
2	2 1/2 "	6 "	.13 "	1 1/4 "	25 "	Adden	4.50	Victim	7.00	View	10.50
3	3 1/4 "	6 "	.15 "	1 1/2 "	25 "	Afaro	5.00	Victond	8.00	Viewed	14.00
4	3 "	6 "	.18 "	1 1/4 "	25 "	After	5.50	Victory	10.00	Viewfy	17.00
5	3 1/2 "	6 "	.22 "	1 1/2 "	25 "	Ageda	6.50	Victres	13.00	Vigil	21.00
6	3 3/4 "	6 "	.25 "	1 1/2 "	25 "	Aider	8.00	Victual	18.00	Vigilan	27.00
8	4 "	6 "	.33 "	2 "	25 "	Aimed	10.00	Viduah	25.00	Vignet	35.00

# GOULDS CISTERN SUCTION PUMP.

WITH REVOLVING BEARER TOP AND BOLTED BASE.

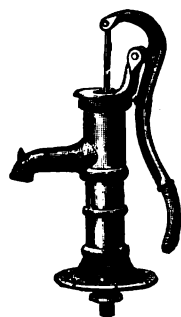


FIG. 200.

The cut shows our Fig. 200, with broad bearing and high base.

A substantial hub on the under side of the base has threads on it for coupling on an iron nut with gas-pipe threads cut in it for connecting wrought-iron pipe, while with each Pump is a brass tube for soldering lead pipe. To prevent freezing, raise lever to extreme height thus allowing water to leave cylinder.

FIG. 200. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	5 in.	.07 gal.	1 in. pipe.	25 ft.	Aired	\$3.50	Ember	\$5.50	Endow	\$7.75
1	2 1/4 "	6 "	.10 "	1 "	25 "	Airy	4.00	Emboss	6.00	Enjoy	8.75
2	2 1/2 "	6 "	.13 "	1 1/4 "	25 "	Akin	4.50	Emery	7.00	Ennui	10.50
3	3 1/4 "	6 "	.15 "	1 1/2 "	25 "	Alas	5.00	Emit	8.00	Enter	14.00
4	3 "	6 "	.18 "	1 1/4 "	25 "	Allied	5.50	Empty	10.00	Entry	17.00
5	3 1/2 "	6 "	.22 "	1 1/2 "	25 "	Ally	6.50	Enact	13.00	Enved	21.00
6	3 3/4 "	6 "	.25 "	1 1/2 "	25 "	Alms	8.00	End	18.00	Envy	27.00
8	4 "	6 "	.33 "	2 "	25 "	Alsod	10.00	Vigor	25.00	Vigorous	35.00

We can fit our Cistern Pumps with brass lower valves and metallic packing for hot water, at an extra price. (See page 17.)

Brass Cylinder Pumps have brass plungers. Brass pumps have all parts brass except lever, bearer and base.

# GOULDS CISTERN SUCTION PUMP.

WITH REVOLVING BEARER TOP AND BOLTED BASE.

Fig. 201 represents a Cistern Suction Pump, with revolving bearer top and bolted base. It is 1.17 in. taller than Fig. 200, on opposite page. Base is bolted to pump with leather packing between. Fitted for lead or wrought-iron pipe, or both, as ordered. To prevent freezing, raise the lever to extreme height thus allowing water to leave cylinder.

FIG. 201. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	5 in.	.07 gal.	1 in. pipe.	25 ft.	Alum	\$4.00	Altaic	\$6.50	Clucbol	\$8.75
1	2 1/4 "	6 "	.10 "	1 1/4 "	25 "	Amid	4.50	Asker	7.00	Clucab	9.75
2	2 1/2 "	6 "	.13 "	1 1/2 "	25 "	Arena	5.00	Askew	8.00	Clucik	11.50
3	2 3/4 "	6 "	.15 "	1 3/4 "	25 "	Arch	5.75	Asking	9.00	Clucom	15.00
4	3 "	6 "	.18 "	1 1/2 "	25 "	Arm	6.25	Asp	11.00	Clucub	18.00
5	3 1/4 "	6 "	.22 "	1 1/2 "	25 "	Armory	6.75	Aspect	14.00	Cludac	22.00
6	3 1/2 "	6 "	.25 "	1 1/2 "	25 "	Art	8.00	Aspen	19.00	Cludis	28.00
8	4 "	6 "	.33 "	2 "	25 "	Ask	10.00	Asperate	26.00	Cludof	36.00



FIG. 201.

# GOULDS CISTERN SUCTION PUMP.

WITH REVOLVING BEARER TOP AND BRACKETS.

The cut, Fig. 202 1/2, represents our new style Revolving Top Cistern Pump with brackets. This is in many instances a more convenient form than a pump on base. It can be secured to the wall in any place desired, and made to take the least possible room. Fitted for either lead or wrought-iron pipe, or both, as ordered.

FIG. 202 1/2. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	5 in.	.07 gal.	1 in. pipe.	25 ft.	Axe	\$3.50	Epic	\$5.50	Error	\$7.75
1	2 1/4 "	6 "	.10 "	1 1/4 "	25 "	Black	4.00	Epoch	6.00	Erupt	8.75
2	2 1/2 "	6 "	.13 "	1 1/2 "	25 "	Bad	4.50	Equal	7.00	Espy	10.50
3	2 3/4 "	6 "	.15 "	1 3/4 "	25 "	Bagged	5.00	Equip	8.00	Etch	14.00
4	3 "	6 "	.18 "	1 1/2 "	25 "	Bail	5.50	Era	10.00	Ethel	17.00
5	3 1/4 "	6 "	.22 "	1 1/2 "	25 "	Balied	6.50	Erect	13.00	Etherd	21.00
6	3 1/2 "	6 "	.25 "	1 1/2 "	25 "	Bake	8.00	Err	18.00	Ethic	27.00

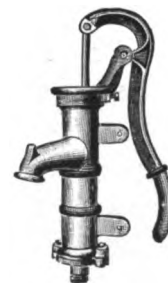


FIG. 202 1/2.

We can fit our Cistern Pumps with brass lower valves and metal packing for hot water at extra price. (See page 17.) Brass Cylinder Pumps have brass plungers. Brass Pumps have all parts brass except lever, bearer and base.

# GOULDS CISTERN SUCTION PUMP.

WITH REVOLVING BEARER TOP, DOUBLE ROD AND GUIDE.

The cut shows one of our Cistern Pumps, with double rods and guide rod. So constructed, they work with more uniform stroke and are on this account much preferred in some localities. In other respects they are just like our other Cistern Pumps.

Fitted for lead or wrought-iron pipe, or both, as ordered.



FIG. 210.

FIG. 210. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction Fitted for.	Lift.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ in.	6 in.	.10 gal.	1¼ in. pipe.	25 ft.	Scoted	\$5.00	Virtual	\$7.00	Viscid	\$9.75
2	2½ "	6 "	.13 "	1½ "	25 "	Scoff	5.50	Virtue	8.00	Viscous	11.50
3	2¾ "	6 "	.15 "	1¾ "	25 "	Birdseye	6.00	Bonded	9.00	Bondage	15.00
4	3 "	6 "	.18 "	1¾ "	25 "	Scoop	6.50	Virulen	11.00	Visela	18.00
6	3½ "	6 "	.25 "	1½ "	25 "	Scope	9.00	Virus	19.00	Vishnu	28.00
8	4 "	6 "	.32 "	2 "	25 "	Score	11.00	Visage	26.00	Visible	36.00

# GOULDS CISTERN SUCTION PUMP.

WITH REVOLVING BEARER TOP, BRACKETS AND DOUBLE ROD AND GUIDE.

Fig. 1051 represents our Cistern Pump with double rod and guide and brackets for attaching to wall. The bearer top may be turned to suit location. The double rod and guide make this Pump well adapted to hard usage.

Fitted for either lead or wrought-iron pipe, or both, as ordered.



FIG. 1051.

FIG. 1051. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ in.	6 in.	.10 gal.	1 in. pipe.	25 ft.	Camcul	\$5.00	Camtea	\$7.00	Cavjell	\$9.75
2	2½ "	6 "	.13 "	1¼ "	25 "	Camram	5.50	Camtill	8.00	Cavkol	11.50
3	2¾ "	6 "	.15 "	1½ "	25 "	Camreb	6.00	Camtop	9.00	Cavkra	15.00
4	3 "	6 "	.18 "	1¾ "	25 "	Camric	6.50	Camtub	11.00	Cavlow	18.00
6	3½ "	6 "	.25 "	1½ "	25 "	Camroof	9.00	Canab	19.00	Cavium	28.00
8	4 "	6 "	.32 "	2 "	25 "	Visahb	11.00	Visail	26.00	Visajf	36.00

We can fit our Cistern Pumps with brass lower valves and metal packing for hot water, at extra price. (See page 17.) *Brass Cylinder Pumps* have brass plungers. *Brass Pumps* have all parts brass except lever, bearer and base.

# GOULDS MOLASSES OR HOT-LIQUID PUMP.

WITH REVOLVING BEARER TOP AND DOUBLE ROD AND GUIDE. METALLIC FITTED.

The cut represents our **Fig. 444**, built for pumping molasses, syrups of any kind, tar, oil, or any other liquids of any consistency, either hot or cold. The piston, piston rod, valves and connecting tube of the iron Pumps are made of brass, while the balance is constructed of iron. When ordered of brass, the whole Pump is made of that metal except the base, top and lever, and is so constructed that no iron is brought in contact with the liquid.

When used for hot liquids we would urge placing the Pump as close to them as possible, as the vapors arising will qualify the vacuum produced by the Pump.

Fitted for lead or wrought-iron pipe connections, as ordered.



**FIG. 444.**

**FIG. 444. SIZES, PRICES, ETC.**

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1½ in. pipe.	25 ft.	Folly	\$12.00	Forcep	\$20.00
4	3 in.	6 in.	.18 "	1½ "	25 "	Fond	15.00	Ford	25.00
6	3½ "	6 "	.25 "	1½ "	25 "	Fontal	17.00	Forel	30.00
8	4 in.	6 "	.33 "	2 "	25 "	Food	21.00	Forge	36.00
10	4½ "	6 "	.41 "	2½ "	25 "	Fopab	25.00	Forky	42.00

# "DUKE" PITCHER SPOUT SUCTION PUMP.

WITH REVOLVING BEARER TOP AND BOLTED BASE.

**Fig. 923** is our new closed top Pitcher Spout Pump. It is of less weight and bulk than our regular stock Pitcher Pump but on that account not lacking in either strength or capacity, for it possesses both.

Again, one thousand of these Pumps can be transported for two thirds the cost of same number of regular Pumps.

We build but the leading size specified below and fit for iron or lead pipe or both, as ordered.



**FIG. 923.**

**FIG. 923. SIZE, PRICE, ETC.**

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	Cipher.	Price.
2	3 in.	4 in.	.12 gal.	1½ in. pipe.	25 ft.	Weyed	\$4.25

# GOULDS PITCHER SPOUT SUCTION PUMP.

WITH OPEN REVOLVING BEARER TOP AND BOLTED BASE.

Fig. 205 shows our Pitcher Spout Pump with open top. They are fitted up in the very best manner, with revolving standard or bearer and so made that by raising the lever the valves are tripped and the water all let out of the Pump.

These Pumps are arranged to be used for either lead or wrought-iron pipe, by a coupling nut fastened to the hub under the base, through which a brass soldering tube is introduced. Inside the nut are gas-pipe threads into which iron pipe can be screwed when this connection is desired.

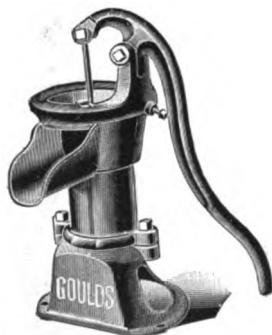


FIG. 205.

FIG. 205. SIZES, PRICES, ETC.

No.	Dia.	Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	IRON.		BRASS LINED.		PORC'L'N LINED.	
							Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2½ in.	4 in.	.09 gal.	1 in. pipe.	25 ft.	Baled		\$4.25	Toledo	\$6.50	Churuc	\$6.50
2	3 "	4 "	.12 "	1½ "	25 "	Balky		4.75	Toiles	7.25	Churva	7.25
3	3½ "	4 "	.17 "	1½ "	25 "	Ball		5.25	Tolal	8.00	Churvic	8.00
4	4 "	4 "	.22 "	1½ "	25 "	Balmo		5.75	Tolling	9.00	Churwoc	9.00
5	4½ "	4 "	.28 "	1½ "	25 "	Band		6.25	Tombeby	10.00	Chusab	10.00

# GOULDS PITCHER SPOUT SUCTION PUMP.

WITH CLOSED REVOLVING BEARER TOP AND BOLTED BASE.

Fig. 205½ shows our standard closed top Pitcher Spout Pump. They are fitted with revolving bearer and so made that by raising the lever the valves are tripped and the water all let out of the Pump.

These Pumps are arranged to be used for either lead or wrought-iron pipe, by a coupling nut fastened to the hub under the base, through which a brass soldering tube is introduced. Inside the nut are gas-pipe threads into which iron pipe can be screwed when this connection is desired.



FIG. 205½.

FIG. 205½. SIZES, PRICES, ETC.

No.	Dia.	Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	IRON.		BRASS LINED.		PORC'L'N LINED.	
							Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2½ in.	4 in.	.09 gal.	1 in. pipe.	25 ft.	Banked		\$4.25	Bonafide	\$6.50	Cleaba	\$6.50
2	3 "	4 "	.12 "	1½ "	25 "	Barb		4.75	Briefness	7.25	Cleaboc	7.25
3	3½ "	4 "	.17 "	1½ "	25 "	Barky		5.25	Cabinet	8.00	Cleabul	8.00
4	4 "	4 "	.22 "	1½ "	25 "	Barned		5.75	Casined	9.00	Cleabber	9.00

# GOULDS PITCHER SPOUT SUCTION PUMP.

WITH REVOLVING BEARER TOP AND PATENT VACUUM BASE.

Fig. 208 is the same as our Fig. 205½ (page 22), and in addition it has an improvement in the base of the Pump. Oftentimes in driven wells, where the soil is so close as to make an air-tight joint around the pipe, an ordinary Pump will not work well; while with the Vacuum Base Pump all difficulty is obviated, for by creating a vacuum in the base and permitting the water to form there a reservoir, a constant supply of water is obtained for the Pump. We fit them always for wrought-iron pipe, with the thread cut in the hub of the base.

*Please state in your orders whether you wish them with open or closed tops.*

**FIG. 208. SIZES, PRICES, ETC.**

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	IRON.		BRASS LINED.		PORC'L'N LINED.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2½ in.	4 in.	.09 gal.	1 in. pipe.	25 ft.	Birdy	\$4.75	Chusif	\$7.00	Croatic	\$7.00
2	3 " "	4 " "	.12 " "	1¼ " "	25 " "	Bite	5.25	Chusom	7.75	Crotan	7.75
3	3½ " "	4 " "	.17 " "	1½ " "	25 " "	Blast	5.75	Chusud	8.50	Crotco	8.50



**FIG. 208.**

# GOULDS PITCHER SPOUT SUCTION PUMP.

WITH REVOLVING BEARER TOP AND BOLTED BASE.

Fig. 209 shows our new style Pitcher Pump with a closed spout. Thus constructed the water is confined in the spout and cannot wash over. These are made like our other Pitcher Pumps, with revolving brake, bolt fastenings and cut-off base, and have a projection for holding bucket.

These Pumps we make with both open and closed tops, as ordered, and we can also make them with our patent vacuum base at a slight increase in expense.

*Please state in your order whether you wish them fitted for lead or wrought-iron pipe, also whether with open or closed tops.*

To prevent freezing, raise lever to extreme height, thus allowing water to leave cylinder.

**FIG. 209. SIZES, PRICES, ETC.**

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction fitted for.	Lift.	IRON.		BRASS LINED.		PORC'L'N LINED.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2½ in.	4 in.	.09 gal.	1 in. pipe.	25 ft.	Waled	\$4.25	Clebjac	\$6.50	Cleblok	\$6.50
2	3 " "	4 " "	.12 " "	1¼ " "	25 " "	Bleat	4.75	Clebkub	7.25	Clecac	7.25
3	3½ " "	4 " "	.17 " "	1½ " "	25 " "	Walk	5.25	Cleblip	8.00	Clecim	8.00



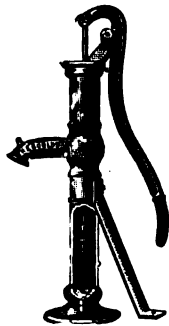
**FIG. 209.**

# “SOUTHERN STAR” SUCTION PUMP.

FOR OUT-DOOR USE IN WARM CLIMATES.

We have frequent calls for a Suction and Lift Pump taller and heavier than our largest Cistern and Pitcher Pumps, and offer **Fig. 607**, which we build about 41 inches high.

It is provided with revolving bearer top and has a long heavy lever. The Pump stock acts as a cylinder, in which is the plunger, and can be emptied of water by raising the lever, thus tripping valve seated on the base. A strong brace gives rigidity to the Pump.



**FIG. 607.**

**FIG. 607. SIZES, PRICES, ETC.**

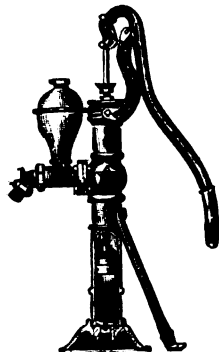
No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	1 1/4 in. pipe.	25 ft.	Moredy	\$8.50
5	3 1/4 "	6 "	.22 "	1 1/2 "	25 "	Morned	9.00

# “SOUTHERN STAR” FORCE PUMP.

FOR OUT-DOOR USE IN WARM CLIMATES.

This Pump is about 50 inches high, has revolving brake or fulcrum, a strong, heavy lever, and is in every way calculated to render good service. A thread is cut on the end of the spout, and with each Pump is sent a half hose coupling and nut for attaching hose.

As in **Fig. 607**, shown above, the plunger works in the stock of Pump, which can be emptied of water by raising the lever, thus tripping the valve in the base.



**FIG. 608.**

**FIG. 608. SIZES, PRICES, ETC.**

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge fitted for.	*Lift and Force.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	1 1/4 in. pipe.	1 in. hose.	50 ft.	Mort	\$13.00
5	3 1/4 "	6 "	.22 "	1 1/2 "	1 "	50 "	Mossy	14.00
6	3 1/2 "	6 "	.25 "	1 3/4 "	1 "	30 "	Mostack	15.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 ft. above water.

When ordered with cock spout we add \$2.50 to list price.



# GOULDS "STAR" ANTI-FREEZING WELL LIFT PUMPS.

WITH CAST OR WROUGHT-IRON CONNECTING PIPE.

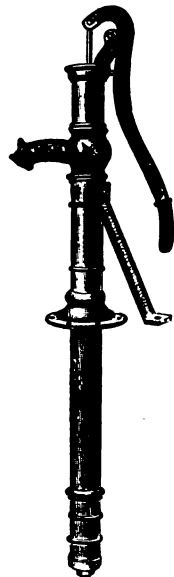


FIG. 206.

Fig. 206 is adapted for out-door cisterns and shallow wells where water is not to be lifted over 15 or 25 feet. It is composed of a standard, cast-iron connecting pipe and cylinder, having the valves in it. The internal diameter of the standard is a trifle larger than that of the cylinder; hence the plunger can be drawn up through it, repaired and replaced if ever necessary.

Pump base to bottom of cylinder,  $3\frac{1}{2}$  feet.

Fig. 207 is similar in design to Fig. 206, but has wrought-iron connecting pipe. By adding to the connecting pipe and piston rod and so dropping the cylinder farther into the well until the cylinder is within, say, 15 to 20 feet of the surface of the water, this Pump could be used in wells from 30 to 40 feet deep.

Base to bottom of cylinder, 4 feet.

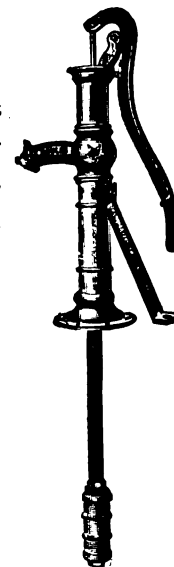


FIG. 207.

FIG. 206. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	Cipher.	Price.
1	2 in.	6 in.	.08 gal.	1 in. pipe.	25 ft.	Basrell	\$5.50
2	2 $\frac{1}{4}$ "	6 "	.10 "	1 "	25 "	Bath	7.00
3	2 $\frac{1}{2}$ "	6 "	.13 "	1 $\frac{1}{4}$ "	25 "	Beamed	7.50
4	2 $\frac{3}{4}$ "	6 "	.15 "	1 $\frac{1}{2}$ "	25 "	Bean	8.00
5	3 "	6 "	.18 "	1 $\frac{3}{4}$ "	25 "	Beard	8.50

FIG. 207. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	*Lift.	Cipher.	Price.
1	2 $\frac{1}{4}$ in.	6 in.	.10 gal.	1 in. p'pe.	40 ft.	Bellrag	\$7.00
2	2 $\frac{1}{2}$ "	6 "	.13 "	1 $\frac{1}{4}$ "	40 "	Beltv	7.50
3	2 $\frac{3}{4}$ "	6 "	.15 "	1 $\frac{1}{2}$ "	40 "	Bendam	8.00
4	3 "	6 "	.18 "	1 $\frac{3}{4}$ "	30 "	Bent	8.50
5	3 $\frac{1}{4}$ "	6 "	.20 "	1 $\frac{1}{2}$ "	30 "	Best	9.00

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water.

# GOULDS ANTI-FREEZING WELL LIFT PUMPS.

WITH WROUGHT-IRON CONNECTING PIPE AND PATENT SAND VALVE.



FIG. 1018.

Fig. 1018 represents our latest design in Anti-Freezing Well Lift Pumps, with wrought-iron connecting pipe, for out-door cisterns and shallow wells—dug, drilled or driven—where the water is not more than 25 feet below ground line. Pump has revolving top, recessed or cupped, to admit priming if necessary.

Fig. 1019 represents same standard with revolving tight top cap, polished rod and link above. This style of Pump has the advantage that a tight top offers against anything finding its way into the Pump.

Both Pumps are tapped for and receive pipe near the spout. To reduce cost of manufacture and facilitate shipment, we offer with three-inch cylinder only.

Base to bottom of cylinder, 4 feet.



FIG. 1019.

FIG. 1018. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	* Lift.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	1¼ in. pipe.	30 ft.	Diestock.	\$8.00

FIG. 1019. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	* Lift.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	1¼ in. pipe.	30 ft.	Divela.	\$8.75

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water.

# GOULDS "NEW STAR" ANTI-FREEZING WELL LIFT PUMPS.

WITH WROUGHT-IRON CONNECTING PIPE AND PATENT SAND VALVE.

This, our best of its kind, is called the "New Star" Well Pump.

When built as described, it is intended for out-door cisterns and shallow wells — dug, drilled or driven — where water is not more than 25 feet below ground line.

In our opinion, this Pump, as shown by the illustrations, is desirable in every respect, and fully supplies the average demand for a Pump of its kind.

Fig. 551 is somewhat taller than Fig. 550 and proportionately heavier, and can be used for same purposes.

These Pumps are tapped and receive the wrought-iron pipe near spout and not at the base.

Pump base to bottom of cylinder, 4 feet.

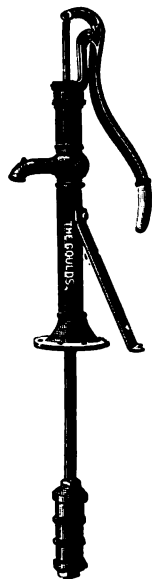


FIG. 550.



FIG. 551.

FIG. 550. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per stroke.	Suction.	*Lift.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1½ in. pipe.	40 ft.	Varvels	\$8.00
3	2¾ " "	6 " "	.15 " "	1½ " "	40 " "	Vased	8.25
4	3 " "	6 " "	.18 " "	1½ " "	30 " "	Vassal	8.50
5	3¼ " "	6 " "	.22 " "	1½ " "	30 " "	Vast	8.75

FIG. 551. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	*Lift.	Cipher.	Price.
3	2½ in.	6 in.	.15 gal.	1½ in. pipe.	50 ft.	Vastley	\$8.75
4	3 " "	6 " "	.18 " "	1½ " "	40 " "	Vasty	9.00
5	3¼ " "	6 " "	.22 " "	1½ " "	40 " "	Vatad	9.25
6	3½ " "	6 " "	.25 " "	1½ " "	40 " "	Vastel	9.75

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water.

# GOULDS "NEW STAR" ANTI-FREEZING WELL LIFT PUMPS.

WITH WROUGHT-IRON CONNECTING PIPE AND PATENT SAND VALVE.



FIG. 847 1/2.

Fig. 847 1/2 represents our "New Star" Well Pump, with bowl or funnel-shape cap. This style of Pump is a favorite with well-drivers, for in opening and cleaning out new wells it is sometimes necessary to prime Pump and this top cap is especially well adapted for that purpose.

Fig. 848 1/2 is the same standard with our admirable tight top cap, polished rod and links above. We think this Pump combines the best features of this class, for the tight top prevents all stones, sticks or ice finding their way into the Pump.

The general adaptations and capacities of these Pumps are briefly told in our tables below.

Both of these Pumps are tapped to receive wrought-iron pipe near the spout, and not at the base.

Pump base to bottom of cylinder, 4 feet.

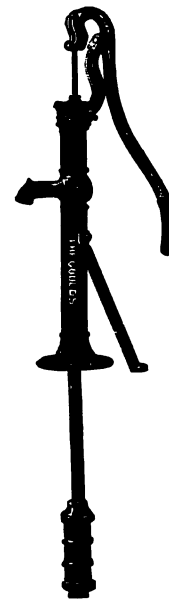


FIG. 848 1/2.

FIG. 847 1/2. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	* Lift.	Cipher.	Price.
2	2 1/2 in.	6 in.	.13 gal.	1 1/2 in. pipe.	50 ft.	Weeler	\$8.00
3	2 3/4 "	6 "	.15 "	1 3/4 "	50 "	Weeleaf	8.25
4	3 "	6 "	.18 "	1 3/4 "	40 "	Weeletu	8.50
5	3 1/4 "	6 "	.22 "	1 3/4 "	40 "	Weeleu	8.75

FIG. 848 1/2. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	* Lift.	Cipher.	Price.
2	2 1/2 in.	6 in.	.13 gal.	1 1/2 in. pipe.	50 ft.	Weltud	\$8.75
3	2 3/4 "	6 "	.15 "	1 3/4 "	50 "	Weltud	9.00
4	3 "	6 "	.18 "	1 3/4 "	40 "	Weltvd	9.25
5	3 1/4 "	6 "	.22 "	1 3/4 "	40 "	Weltwe	9.50

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water.

# GOULDS ANTI-FREEZING WELL LIFT PUMPS.

WITH WROUGHT-IRON CONNECTING PIPE AND PATENT SAND VALVE.

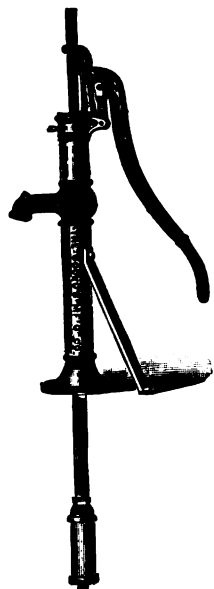


FIG. 1039.

Fig. 1039 represents our new Anti-Freezing Wind Mill Lift Pump for shallow wells. In this style of Pump the rod is guided above and moves up and down in a vertical line without oscillating. It also constitutes a tight top, offering protection against stones or sticks finding their way into Pump. Pump is tapped and receives wrought-iron connecting pipe near the spout.

Fig. 553 shows our "New Star" Wind Mill Lift Pump, with tight top. This Pump is somewhat heavier than Fig. 1039, but principal features are the same. Piston rod is guided above and moves up and down in a straight line.

Pump has supporting brace and is tapped for pipe near the spout.

With special long flat rods for Wind Mill, 50 cents extra list.



FIG. 553.

FIG. 1039. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	* Lift.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	1¼ in. pipe.	30 ft.	Divellac	\$9.00

FIG. 553. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	* Lift.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1¼ in. pipe.	40 ft.	Veck	\$9.00
3	2¾ in.	6 in.	.15 "	1¼ in. pipe.	40 "	Vection	9.25
4	3 in.	6 in.	.18 "	1¼ in. pipe.	30 "	Vector	9.50
5	3¼ in.	6 in.	.22 "	1¼ in. pipe.	30 "	Veature	9.75

\* Depth of Wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water.

# GOULDS ANTI-FREEZING WELL PUMPS.

WITH CAST OR WROUGHT-IRON CONNECTING PIPE AND PATENT SAND VALVE.

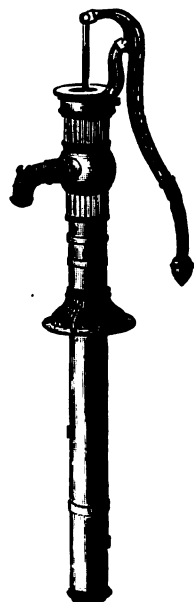


FIG. 227.

Fig. 227 shows an open-top Well Lift Pump for wells from 15 to 25 feet deep. It is rendered anti-freezing by placing the valves out of reach of frost. The piston can be drawn out by simply removing bearer top. Base to bottom of cylinder,  $3\frac{1}{2}$  feet.

Fig. 240 shows our heavy Well Force Pump with cast-iron pipe connecting standard and cylinder, also air chamber on spout. When constructed in this manner these Pumps are adapted for wells of depths not exceeding 25 feet. The piston can be withdrawn from cylinder up through the standard when desired.

Can also furnish these Pumps with wrought-iron connecting pipe at same list price if desired, and by changing position of cylinder they can be adapted for wells of any depth.

Pump base to bottom of cylinder,  $3\frac{1}{2}$  feet.

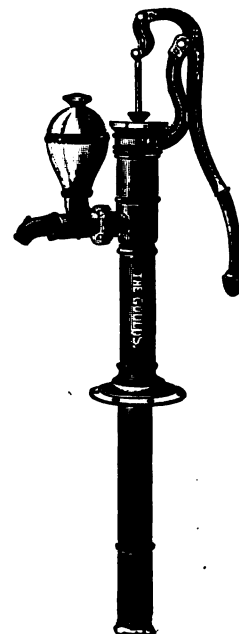


FIG. 240.

FIG. 227. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	Cipher.	Price.
5	$3\frac{1}{4}$ in.	6 in.	.22 gal.	$1\frac{1}{2}$ in. pipe.	25 ft.	Brow	\$12.00
7	$3\frac{3}{4}$ "	6 "	.29 "	$1\frac{1}{2}$ "	25 "	Brush	13.00

FIG. 240. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	*Lift and Force.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	$1\frac{1}{2}$ in. pipe.	$1\frac{1}{2}$ in. pipe and 1 in. hose.	60 ft.	Carded	\$17.00
7	$3\frac{1}{4}$ "	6 "	.29 "	$1\frac{1}{2}$ "	$1\frac{1}{2}$ " " 1 "	45 "	Carreen	19.00

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water or total lift and force from supply to point of delivery.

# GOULDS ANTI-FREEZING WELL PUMPS.

WITH ADJUSTABLE BASE AND BRACE, SYPHON SPOUT AND REVOLVING BEARER TOP.

Figs. 1020 and 1021 illustrate our new Set Length Lift and Force Pumps with adjustable base and brace, syphon spout and revolving bearer top.

The principal feature of these new Pumps is the wrought-iron pipe stock with base and brace, which can be adjusted to meet any requirements of height of lever and spout. Under the base is a heavy malleable pipe nut connecting standard with set length. This permits extension of set length with the least possible trouble. When so ordered, we can furnish stock or standard complete without set length, adapting it for any style of lower working cylinder.

Under Fig. 1020 we list Set Length Lift Pump without stuffing box and hose coupling. Under Fig. 1021, Set Length Force Pump with stuffing box and hose coupling. We list Pumps with outside attachment iron cylinders, also with inside attachment brass body cylinders. Base to bottom of cylinder, 4 feet.

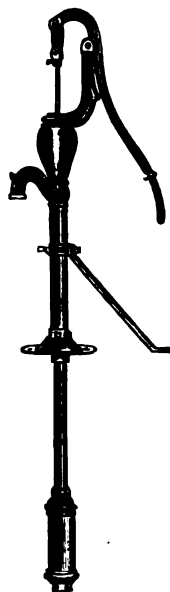


FIG. 1020.

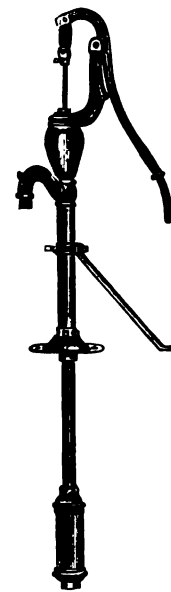


FIG. 1021.

FIG. 1020. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	* Lift.	IRON.		BRASS BODY CYLINDER.	
						Cipher.	Price.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	1¼ in. pipe.	30 ft.	Aslag	\$9.00	Asmear	\$13.00

FIG. 1021. SIZE, PRICE, ETC.

No	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS BODY CYLINDER.	
							Cipher.	Price.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	1¼ in. pipe.	¾ in. hose.	30 ft.	Asoak	\$11.50	Asonant	\$15.50

\* Depth of wells to which Pumps may be adapted by lowering Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# "NEW STAR" ANTI-FREEZING WELL FORCE PUMPS.

WITH WROUGHT-IRON CONNECTING PIPE AND PATENT SAND VALVE.

Fig. 852½ represents our new Well Force Pump.

The Standard is in our opinion the best of this class, and we think the Trade will appreciate the advantages this Pump offers in having our admirable revolving tight top and outlet back of spout for attaching pipe, as well as being tapped for and receiving connecting pipe in the stock near the spout.

Fig. 882½ is the same in all respects as Fig. 852½, with the addition of a cock on the spout.

When pipe is connected to opening behind the spout, there must be some means for closing the spout opening, and a cock does this. The nose of cock is cut gas-pipe thread and is furnished with a nut and tube for hose. Pump base to bottom of cylinder, 4 feet.

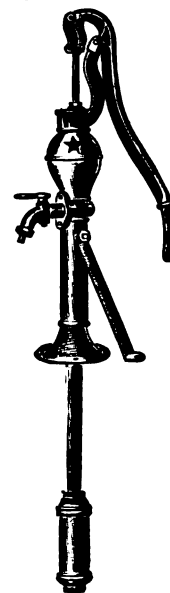
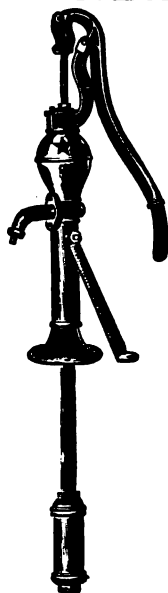


FIG. 852½.

Fig. 852½. SIZES, PRICES, ETC.

FIG. 882½.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	*Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal	1¼ in. pipe.	1¼ in. pipe and ¾ in. hose.	60 ft.	Valeus	\$12.00
3	2¾ " "	6 " "	.15 " "	1¼ " "	1¼ " " ¾ " "	60 " "	Ware	12.25
4	3 " "	6 " "	.18 " "	1¼ " "	1¼ " " ¾ " "	60 " "	Wareful	12.50
5	3¼ " "	6 " "	.22 " "	1¼ " "	1¼ " " ¾ " "	45 " "	Wareless	13.00

FIG. 882½. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges	*Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1¼ in. pipe.	1¼ in. pipe and ¾ in. hose.	60 ft.	Valeva	\$14.50
3	2¾ " "	6 " "	.15 " "	1¼ " "	1¼ " " ¾ " "	60 " "	Ware	14.75
4	3 " "	6 " "	.18 " "	1¼ " "	1¼ " " ¾ " "	60 " "	Ware	15.00
5	3¼ " "	6 " "	.22 " "	1¼ " "	1¼ " " ¾ " "	45 " "	Warehbl	15.50

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water, or total lift and force from supply to point of delivery.



# "NEW STAR" ANTI-FREEZING WELL FORCE PUMPS.

WITH WROUGHT-IRON CONNECTING PIPE AND PATENT SAND VALVE.

Fig. 424 represents our "New Star" Force Pump Standard arranged with connecting pipe and cylinder. They are provided with an outlet back of the spout for attaching pipe, and the spout has a hose tube for attaching  $\frac{3}{4}$ -inch hose.

Fig. 426 is the same in all respects as Fig. 424, described above, with the addition of a cock on the spout.

When pipe is connected to opening behind the spout, there must be some means for closing the spout opening, and a cock does this. The nose of the cock is cut gas-pipe thread and is furnished with nut and tube for  $\frac{3}{4}$ -inch hose.

These Pumps are tapped for and receive the wrought-iron pipe near the spout and not at the base. Pump base to bottom of cylinder, 4 feet.

With special long flat rods for Wind Mill, 50 cents extra list.

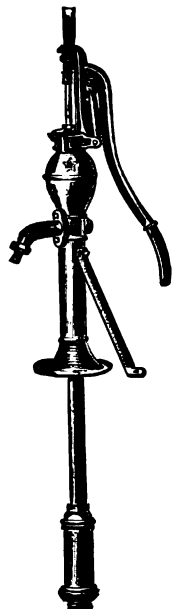


FIG. 424.

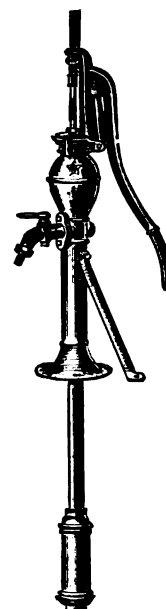


FIG. 426.

FIG. 424. SIZES, PRICES, ETC.

No	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	*Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1½ in. pipe.	1½ in. pipe and ¾ in. hose.	60 ft.	Velabc	\$13.00
3	2¾ " "	6 " "	.15 " "	1½ " "	1½ " " ¾ " "	60 " "	Vell	13.25
4	3 " "	6 " "	.18 " "	1½ " "	1½ " " ¾ " "	60 " "	Vellet	13.50
5	3¾ " "	6 " "	.22 " "	1½ " "	1½ " " ¾ " "	45 " "	Vellum	14.00

FIG. 426. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	* Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1½ in. pipe.	1½ in. pipe and ¾ in. hose.	60 ft.	Vogufz	\$15.50
3	2¾ " "	6 " "	.15 " "	1½ " "	1½ " " ¾ " "	60 " "	Vogle	15.75
4	3 " "	6 " "	.18 " "	1½ " "	1½ " " ¾ " "	60 " "	Voglite	16.00
5	3¾ " "	6 " "	.22 " "	1½ " "	1½ " " ¾ " "	45 " "	Vogued	16.50

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# GOULDS ANTI-FREEZING WELL FORCE PUMPS.

WITH WROUGHT-IRON CONNECTING PIPE AND PATENT  
SAND VALVE.

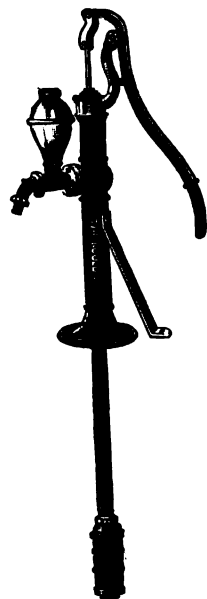


FIG. 854.

Fig. 854 represents a new Well Force Pump with deep bearer top, polished rod and links above. The cut will show its construction, and at the very low price it is offered it represents good value. We aim at simplicity of parts, and these adequately strong for purpose they are intended.

Pump base to bottom of cylinder, 4 feet.

Fig. 264 is a modification of our House Force Pump, rendered anti-freezing and adapted for out-door wells, or those of any depth, by addition of set length and placing working parts—plunger and valve—below frost line and within suction distance of water. Water may be forced through upper discharge into pipe, or delivered at spout. *This cock spout is fitted for hose coupling.*

Pump base to bottom of cylinder, 4 feet.



FIG. 264.

FIG. 854. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	* Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1½ in. pipe.	1½ in. pipe and ¾ in. hose.	60 ft.	Watab	\$13.50
3	2¾ " "	6 " "	.15 " "	1½ " "	1½ " " ¾ " "	60 " "	Watchin	13.75
4	3 " "	6 " "	.18 " "	1½ " "	1½ " " ¾ " "	60 " "	Watchma	14.00
5	3¼ " "	6 " "	.22 " "	1½ " "	1½ " " ¾ " "	45 " "	Water	14.50

FIG. 264. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per stroke.	Suction.	Discharges.	* Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	70 ft.	Clanish	\$16.00
4	3 " "	6 " "	.18 " "	1½ " "	1½ " " 1 " "	70 " "	Clapped	18.00

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# DOUBLE-ACTING WELL FORCE PUMPS.

FOR SHALLOW OR DEEP WELLS, OPEN, DRIVEN, DRILLED OR CASED.

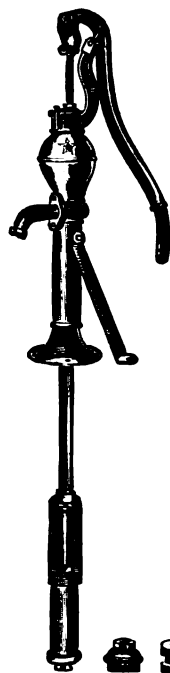


FIG. 1052.

WE illustrate our new Double-Acting Well Force Pumps for shallow or deep wells, open, driven, drilled or cased. The pump cylinder is brass lined and has differential plunger, giving one half the displacement of lower working cylinder and contributing to an even and uniform discharge of water. We dispense with all stuffing boxes and glands, avoid all undue friction, and secure easiest possible working Pump. For lower working cylinder, either our standard pattern iron brass-lined cylinder or brass body cylinder may be used to adapt Pumps for shallow wells of 25 to 30 feet, or deep wells of 75 to 100 feet. Our engravings show Pumps put up for shallow wells; that is, with lower working cylinder screwed into pump cylinder. We also furnish a universal bushing for bottom of upper cylinder and top attachment for lower cylinder. Where wanted for deep wells, unscrew lower cylinder from upper cylinder, and attach universal bushing to bottom of upper cylinder and top cap to lower cylinder, and connect with pipe and rod required for any depth well.

Fig. 1052 shows our Double-Acting Well Force Pump with common top; Fig. 1053, with wind mill top. We price both below made up with brass-lined and also brass body cylinders, complete with attachments for shallow and deep wells.

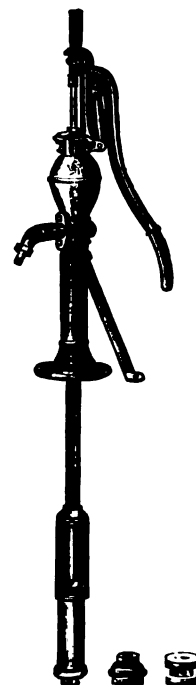


FIG. 1053.

FIG. 1052. SIZES, PRICES, ETC.

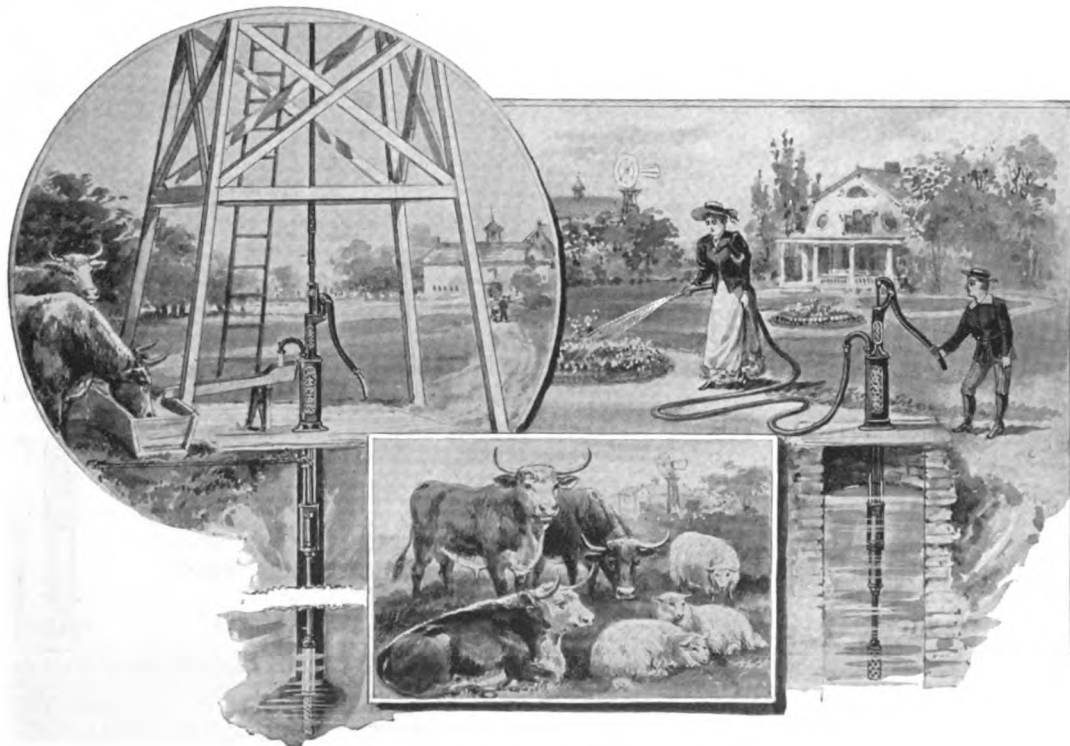
No.	Dia. Lower Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	BRASS LINED CYLINDER.		BRASS BODY CYLINDER.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1¼ in. pipe.	¾ in. hose.	100 ft.	Clehab	\$14.00	Clehum	\$16.00
4	3 "	6 "	.18 "	1½ "	¾ "	75 "	Clejoc	14.50	Clekull	16.50

FIG. 1053. SIZES, PRICES, ETC.

No.	Dia. Lower Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	BRASS LINED CYLINDER.		BRASS BODY CYLINDER.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1¼ in. pipe.	¾ in. hose.	100 ft.	Clubic	\$14.50	Clubist	\$16.50
4	3 "	6 "	.18 "	1½ "	¾ "	75 "	Clubjo	15.00	Clubjoh	17.00

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

## GOULDS "EMPIRE" DOUBLE-ACTING WELL FORCE PUMP.



OUR "Empire" Double-Acting Well Force Pumps are shown above in operation in both shallow and deep wells: the Hand Pump with cylinder screwed in lower working head in shallow well; the Wind Mill Pump with divided or lower cylinder, and three-way distributing cock in drilled deep well.

In operation these Pumps discharge a uniform and powerful stream of water, yet work easier than the ordinary Lift and Force Pumps.

They can be used in any style of well, opened or drilled, not exceeding 100 feet deep.

This line of Pumps is fully illustrated and described on pages 37 to 41.

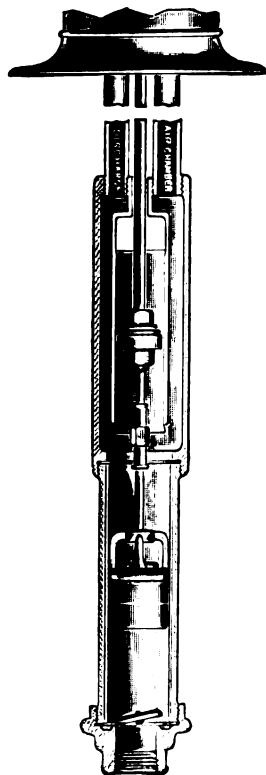
# GOULDS "EMPIRE" DOUBLE-ACTING WELL FORCE PUMPS.

FOR SHALLOW OR DEEP WELLS—OPEN, DRIVEN OR DRILLED.

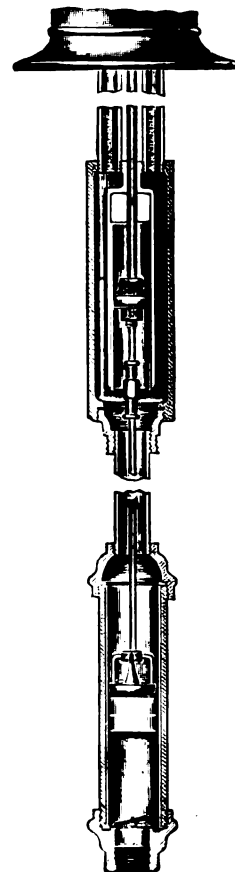
In our new "Empire" Pumps we offer a Double-Acting Well Pump of almost universal adaptation, a pleasing contrast to the multiplicity of styles inseparable from the construction of other Pumps of this type, when used in the different yet common forms of wells. The selection of an "Empire" Pump is governed by the style of bearer top wanted and whether a three-way cock with rod for distributing the water may be required. For the rest, all the "Empire" Pumps are shallow well pumps, deep well pumps, drive well pumps, or casing pumps, as you may choose to name or employ them—all in one Pump.

Briefly described, the "Empire" Pump consists of a standard with bearer top in one piece, cast in two half sections, strongly bolted and holding securely in place the two supporting pipes which form respectively the air chamber and discharge pipes connecting with upper cylinder. This upper cylinder is brass lined and has differential plunger, giving one half the displacement of lower working cylinder and contributing to an even and uniform discharge of water. It will be noticed from our engraving that we dispense with all stuffing boxes or glands by this construction, avoid all undue friction, and secure the easiest possible working Pump. For lower working cylinder, either our standard pattern iron brass-lined cylinder or brass body cylinder may be used to adapt Pumps for shallow wells of 25 to 30 feet, or deep wells of 75 to 100 feet.

Each Pump is furnished complete with brass-lined or brass body lower cylinder, as ordered, and universal bushing complete for either shallow or deep wells, as may be required. While our brass-lined cylinders carry outside attachments, still these are not larger than the outside dimensions of upper cylinder, of which No. 2 will go inside 4-inch well casing, and No. 4 inside 5-inch well casing. With our brass body inside attachment cylinders, Pumps may be used in even smaller casings than given—where well is open or curbed at the top or far enough down to accommodate the set length..



For Shallow Wells.



For Deep Wells.

# GOULDS "EMPIRE" DOUBLE-ACTING WELL FORCE PUMP.

FOR SHALLOW OR DEEP WELLS—OPEN, DRIVEN, DRILLED OR CASED.

For Shallow Wells.

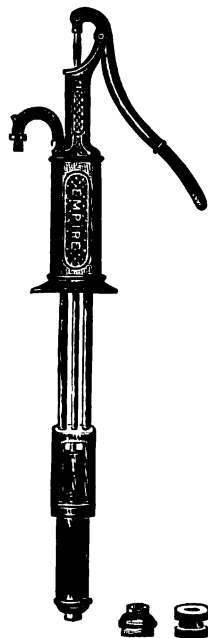


FIG. 1025.

Fig. 1025 illustrates our "Empire" Double-Acting Well Force Pump with Common Top, as adapted for shallow or deep wells. Details of construction and adaptation for different forms of wells will be found on page 37. This bearer top is cast with the parts forming the standard, is not revolving, and cannot be interchanged for other styles. No. 2 Pump will go inside 4-inch well casing; No. 4 Pump, inside 5-inch well casing.

Unless otherwise ordered, we ship all "Empire" Pumps put up for shallow wells; that is, with lower working cylinder screwed into upper cylinder and the universal bushing for bottom of upper cylinder and top attachment for lower cylinder tied on. *Where wanted for deep wells, unscrew lower cylinder from upper cylinder and attach universal bushing to bottom of upper cylinder and top cap to lower cylinder, and connect with pipe and rod required for any depth of well.* Universal bushing, adapting Pumps for shallow or deep wells, strainer and hose connection go with each Pump and are included in prices given below.

For Deep Wells.

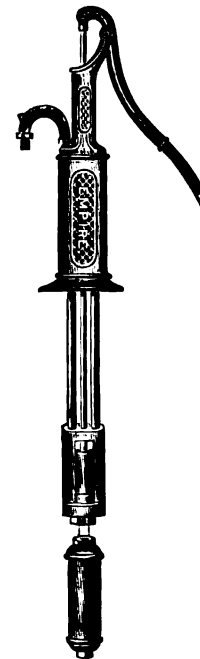


FIG. 1025.

FIG. 1025. SIZES, PRICES, ETC.

No.	Dia. Lower Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	BRASS LINED CYLINDER.		BRASS BODY CYLINDER.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1¼ in. pipe.	¾ in. hose.	100 ft.	Chestoc	\$14.00	Chestpo	\$16.00
4	3 in.	6 in.	.18 "	1¼ in. "	¾ in. "	75 "	Chestabu	14.50	Chetil	16.50

\* Depth of wells to which Pumps may be adapted by lowering cylinders to within 15 or 20 feet of water, or total lift and force from supply to point of delivery.



# GOULDS "EMPIRE" DOUBLE-ACTING FORCE PUMP.

For Shallow Wells.

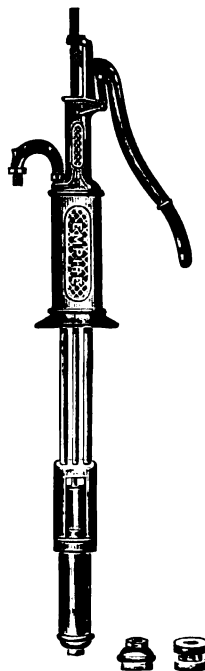


FIG. 1026.

FOR SHALLOW OR DEEP WELLS—OPEN, DRIVEN, DRILLED OR CASED.

Fig. 1026 represents our "Empire" Double-Acting Well Pump, with Wind Mill Top, for shallow or deep wells—open, driven, drilled or cased. Details of construction and adaptation for different forms of wells will be found on page 37. This bearer top is cast with parts forming standard, is not revolving, and is not interchangeable. No. 2 Pump will go inside 4-inch well casing; No. 4 Pump inside 5-inch well casing.

Unless otherwise ordered, we ship all "Empire" Pumps put up for shallow wells; that is, with lower working cylinder screwed into upper cylinder and the universal bushing for bottom of upper cylinder and top attachment for lower cylinder tied on. *Where wanted for deep wells, unscrew lower cylinder from upper cylinder and attach universal bushing to bottom of upper cylinder and top cap to lower cylinder, and connect with pipe and rod for any depth of well.* Universal bushing, adapting Pumps for shallow or deep wells, strainer and hose connection, go with each Pump and are included in price given below.

For Deep Wells.

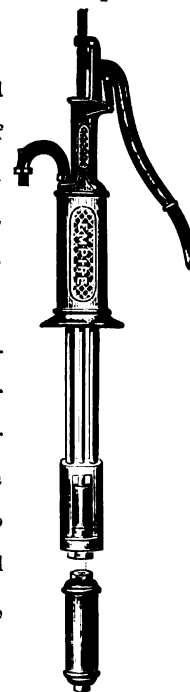


FIG. 1026.

FIG. 1026. SIZES, PRICES, ETC.

No.	Dia. Lower Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	BRASS LINED CYLINDER.		BRASS BODY CYLINDER.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1¼ in. pipe.	¾ in. hose.	100 ft.	Chetja	\$14.50	Chetjob	\$16.50
4	3 "	6 "	.18 "	1¼ "	¾ "	75 "	Chetkab	15.00	Chetlub	17.00

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# GOULDS "EMPIRE" DOUBLE-ACTING WELL FORCE PUMP.

FOR SHALLOW OR DEEP WELLS—OPEN, DRIVEN, DRILLED OR CASSED.

For Shallow Wells.

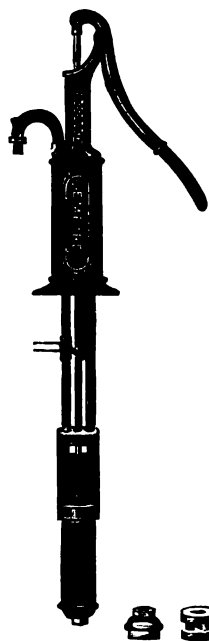


FIG. 1027.

Fig. 1027 represents our "Empire" Double-Acting Well Force Pump with Common Top, Brass Three-Way Cock and Connecting Rod, for shallow or deep wells—open, driven, drilled or cased. Details of construction and adaptation for different forms of wells will be found on page 37. The addition of Three-Way Cock and Connecting Rod for distributing water to any part of premises, house, barns, etc., will increase the usefulness of this Pump for many purposes; No. 2 Pump will go inside 4-inch well casing; No. 4 Pump, inside 5-inch well casing.

Unless otherwise ordered, we ship all "Empire" Pumps put up for shallow wells; that is, with lower working cylinder screwed into upper cylinder and the universal bushing for bottom of upper cylinder and top attachment for lower cylinder tied on. *Where wanted for deep wells, unscrew lower cylinder from upper cylinder and attach universal bushing to bottom of upper cylinder and top cap to lower cylinder, and connect with pipe and rod required for any depth of well.* Universal bushing adapting Pumps for shallow or deep wells, strainer and hose connections go with each Pump and are included in prices given below.

For Deep Wells.

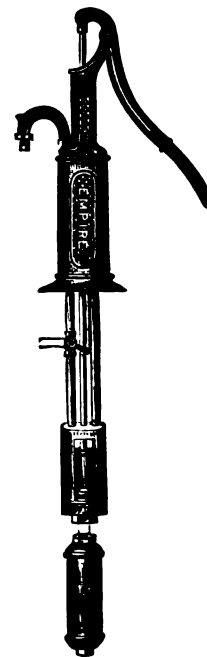


FIG. 1027.

FIG. 1027. SIZES, PRICES, ETC.

No.	Dia. Lower Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lower Discharge.	Upper Discharge.	* Lift and Force.	BRASS LINED CYLINDER.		BRASS BODY CYLINDER.	
								Cipher.	Price.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1¼ in. pipe.	¾ in. pipe.	¾ in. hose.	100 ft.	Chetman	\$16.50	Chetnel	\$18.50
4	3 in.	6 in.	.18 "	1½ in. pipe.	¾ in. pipe.	¾ in. "	75 "	Chetnob	17.00	Chetolu	19.00

\* Depth of wells to which Pumps may be adapted by lowering the Cylinders to within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# GOULDS "EMPIRE" DOUBLE-ACTING WELL FORCE PUMP.

For Shallow Wells.

FOR SHALLOW OR DEEP WELLS—OPEN, DRIVEN, DRILLED OR CASED.

For Deep Wells.

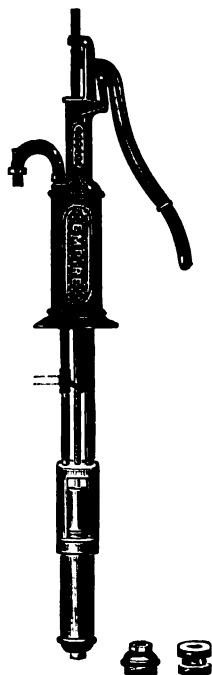


FIG. 1028.

Fig. 1028 represents our "Empire" Double-Acting Well Force Pump with Wind Mill Top, Brass Three-Way Cock and Connecting Rod for shallow or deep wells—open, driven, drilled or cased. Details of construction and adaptation for different forms of wells will be found on page 37. The addition of Brass Three-Way Cock and Connecting Rod for distributing water about the premises will bring this Pump into favorable comparison with other Wind Mill Distributing Pumps. No. 2 Pump will go inside 4-inch well casing; No. 4 Pump inside 5-inch well casing.

Unless otherwise ordered, we ship all "Empire" Pumps put up for shallow wells; that is, with lower working cylinder screwed into upper cylinder and the universal bushing for bottom of upper cylinder and top attachment for lower cylinder tied on. *Where wanted for deep wells, unscrew lower cylinder from upper cylinder and attach universal bushing to bottom of upper cylinder and top cap to lower cylinder, and connect with pipe and rod required for any depth of well.* Universal bushing, adapting Pumps for shallow or deep wells, strainer and hose connection, go with each Pump and are included in prices given below.

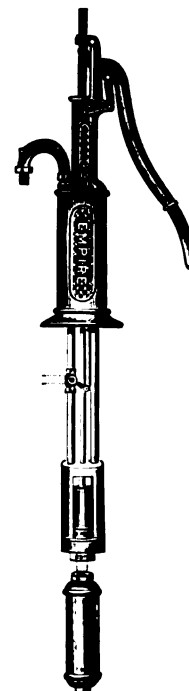
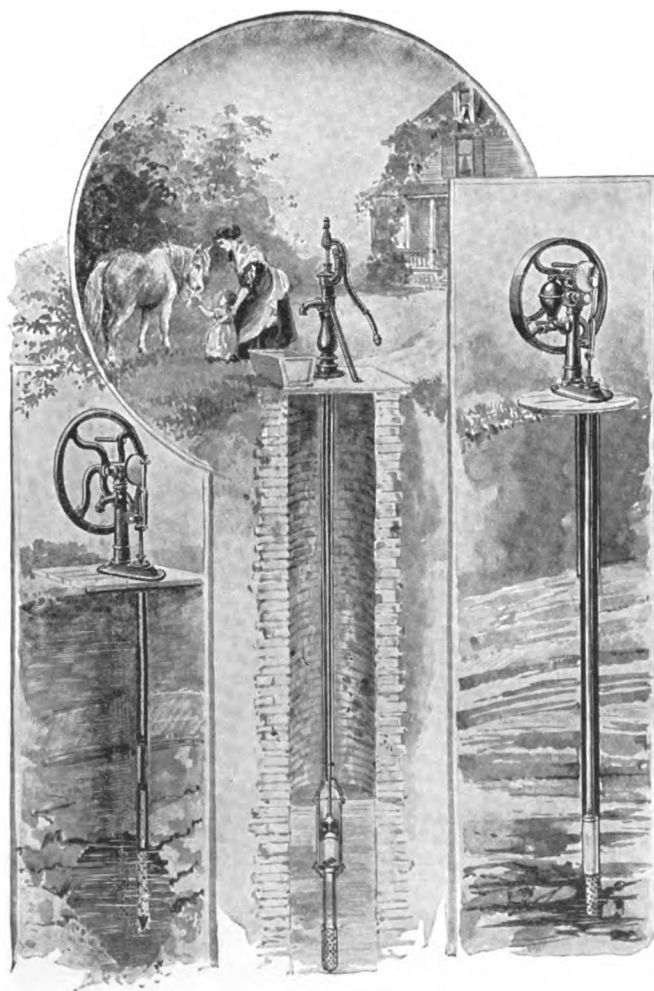


FIG. 1028.

FIG. 1028. SIZES, PRICES, ETC.

No.	Dia. Lower Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lower Discharge.	Upper Discharge.	* Lift and Force.	BRASS LINED CYLINDER.		BRASS BODY CYLINDER.	
								Cipher.	Price.	Cipher.	Price.
2	2½ in.	6 in.	.13 gal.	1½ in. pipe.	¾ in. pipe.	¾ in. hose.	100 ft.	Chetpat	\$17.00	Chetqub	\$19.00
4	3 "	6 "	.18 "	1¼ "	¾ "	¾ "	75 "	Chetral	17.50	Cheuact	19.50

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water, or total lift and force from supply to point of delivery.



## DEEP WELL PUMP STANDARDS AND CYLINDERS

Have an almost universal application where water supply is derived from open, driven or drilled and cased deep wells.

The open or dug and curbed well, as shown in centre of our illustration, is perhaps the most common and usually made where water channels are not more than 50 feet below surface of ground.

We show **Fig. 236**, Lift Pump Standard (page 48), operating **Fig. 613**, Deep Well Pump Cylinder (page 82).

Drive well, shown to the left, is practical where water is found in sand or gravel 20 to 30 feet below surface of ground. Freedom from intervening rocks is essential in making this well.

We show **Fig. 547**, Manual Pumping Apparatus (page 53), operating **Fig. 612**, Deep Well Pump Cylinder (page 82), with **Fig. 524**, Drive Well Pipe Point (page 289), at end of suction pipe. Almost any of our Well Pump Standards and Cylinders might be as well employed.

Drilled and cased wells, as shown to the right, are generally made where rock is encountered and water is considerable distance below ground. The general plan is to line the well with casing down to the rock. In this manner, a practically closed well is secured, free from drainage or pollution from any source.

We show **Fig. 888**, Manual and Power Pumping Apparatus (page 55), operating **Fig. 614**, Deep Well Pump Cylinder (page 82).

This class of Pump Standards will be found, pages 44 to 56, and Pump Cylinders, pages 82 to 89.

# GOULDS DEEP WELL STANDARDS AND CYLINDERS.

FOR OPEN, DRIVEN OR DRILLED WELLS.

On opposite page we illustrate a few of our Deep Well Pumps, Standards and Cylinders, in operation.

These represent, of course, but a few of our styles of Standards and Cylinders, and will treat of these in a general way, referring to our several pages of this class of goods for details of construction, etc.

The power exerted by an ordinary man in working a pump handle continuously must not be estimated above 25 pounds; therefore, if the power required exceeds this amount, provision must be made for more than one man to work at once or the power increased by gears.

It is also easier to raise a given quantity of water with a Double-Barrel Pump than with a Single-Barrel Pump (supposing the capacity of the two barrels together the same as that of the single barrel). The reason of this is that in the single barrel the whole lift comes on one-half of the turn of the handle, while with the double barrel it is distributed over two halves of the turn and you lift only one-half at a time.

The leverage of an ordinary cistern or well pump handle is about 6 to 1.

The leverage on rotary motion Pumping Apparatus and Well Frames is in the proportion of the radius or throw of the handle to the throw of the crank (that is, half the stroke of the Pump). The former is usually about 15 inches. Therefore, with a Pump of 6-inch stroke the leverage is only as  $2\frac{1}{2}$  to 1; with a Pump of 5-inch stroke the leverage is as 3 to 1, etc. This proportion is somewhat increased in Deep Well Frames by the lever at the bottom of the frame to which the pump rod is attached.

If a Pumping Apparatus or Well Frame is provided with wheel and pinion of the proportion of 2 to 1, one-half the power is required to raise water a given distance, but only one-half the water is raised for each turn of the handle; with wheel and pinion as 3 to 1, one-third of the power is required, and but one-third of the quantity raised. Thus, in the same proportion as you gain in power, you lose in the quantity raised in a given time.

For further information we refer to "Useful Notes on Pumps and Hydraulic Machinery," pages 14 and 15 Well Pump Standards and Working Heads for Manual and Machine Power, pages 44 to 55; Well Pump Standards and Working Heads for Manual and Wind Power, pages 56 to 71; Pump Cylinders or Working Barrels, pages 80 to 89; Horse Gear Pumping Apparatuses, Counter Shafts, Working Heads and Cylinders for Irrigation, etc., pages 104 to 117. Also to Tables of Capacity, Power, etc., among last pages.

## GOULDS NEW WELL LIFT PUMP STANDARD.

WITH REVOLVING TOP AND SOLID BASE.

Fig. 1023 represents a new design Well Lift Pump Standard. It is admirably adapted for shallow wells—dug, drilled or driven. Standard has revolving bearer top, which is recessed to permit priming if necessary.



FIG. 1023.

FIG. 1023. SIZE, PRICE, ETC.

No.	Stroke.	Suction.	Well Rod.	* Lift.	Clpher.	Price.
3	6 in.	1 1/4 in. pipe.	3/8 in.	{ 2 1/2 in. Cylinder, 40 ft. } 30 "	Dosedab	\$5.00

Cylinders like Figs. 609, 611, 613, 616 or 619 (pages 82 to 86) are required with this Pump Standard, and cost extra.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water ; smaller Cylinders in proportionately deeper wells.

## GOULDS NEW WELL LIFT PUMP STANDARD.

WITH REVOLVING TIGHT TOP AND SOLID BASE.

Fig. 1024 represents same Standard as above, but with revolving tight top, polished rod and link above. The tight top has the advantage of keeping out stones and other foreign matters.

Both of these Standards have supporting braces.

Always tapped for 1 1/4-inch pipe, although we can fit for 1 1/2-inch or 2-inch, if so ordered.



FIG. 1024.

FIG. 1024. SIZE, PRICE, ETC.

No.	Stroke.	Suction.	Well Rod.	* Lift.	Clpher.	Price.
3	6 in.	1 1/4 in. pipe.	3/8 in.	{ 2 1/2 in. Cylinder, 40 ft. } 30 "	Dosedac	\$5.75

Cylinders like Figs. 609, 611, 613, 616 or 619 (pages 82 to 86) are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standard can be adapted by placing Cylinder within 15 or 20 feet of water ; smaller Cylinders in proportionately deeper wells.

# GOULDS "STAR" WELL LIFT PUMP STANDARD.

WITH REVOLVING TOP AND BOLTED BASE.

Fig. 845 represents our "Star" Well Lift Pump Standard, with revolving top and and bolted base, as we build it in five sizes, given below. The wrought-iron connecting pipe screws into the base, which may be separated from stock by taking out base bolts. This will be found convenient in making rod and pipe connections over wells.

Always fitted for sizes pipe given in table.

FIG. 845. SIZES, PRICES, ETC.

No.	Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
1	6 in.	1 in. pipe.	$\frac{3}{8}$ in.	$2\frac{1}{2}$ in. Cyl., 40 ft.	Walker	\$3.75
2	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	$2\frac{1}{2}$ " 40 "	Walkin	4.25
3	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	$2\frac{1}{2}$ " 40 "	Wally	4.50
4	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	3 " 30 "	Waller	5.00
5	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	$3\frac{1}{4}$ " 30 "	Wallio	5.25

Cylinders like Figs. 609, 611, 613 or 616 (pages 82 to 86) are required with this Pump Standard and cost extra.

\*Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.



FIG. 845.

# GOULDS "NEW STAR" WELL LIFT PUMP STANDARD.

WITH REVOLVING TOP AND SOLID BASE.

Fig. 846 represents our "New Star" Well Pump Standard, with revolving top and solid base, which we can furnish in three sizes, adapted to wells of any depth.

The wrought-iron connecting pipe screws into standard near the spout, and we always tap as given below, although we can tap for  $1\frac{1}{2}$  or 2 inch pipe if so ordered.

FIG. 846. SIZES, PRICES, ETC.

No.	Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
3	6 in.	$1\frac{1}{4}$ in. pipe.	$\frac{3}{4}$ in.	$2\frac{1}{2}$ in. Cyl., 40 ft.	Wallin	\$5.50
4	6 "	$1\frac{1}{4}$ "	$\frac{3}{4}$ "	3 " 40 "	Wallko	6.00
5	6 "	$1\frac{1}{4}$ "	$\frac{3}{4}$ "	$3\frac{1}{4}$ " 40 "	Walopp	6.50

Cylinders like Figs. 609, 611, 613 or 616 (pages 82 to 86) are required with this Pump Standard and cost extra.

\*Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.



FIG. 846.

# GOULDS "NEW STAR" WELL LIFT PUMP STANDARD.

WITH REVOLVING OPEN TOP AND SOLID BASE.



FIG. 849.

Fig. 849 represents our "New Star" Well Pump Standard, with revolving bowl top and solid base. This style Standard is especially adapted for driven wells, as the funnel-shape top admits of readily priming Pump, if ever necessary, in new wells.

Always tapped near the spout for sizes of wrought-iron pipe given below, although we can fit for  $1\frac{1}{2}$  or 2 inch, if so ordered.

FIG. 849. SIZES, PRICES, ETC.

No.	Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
3	6 in.	$1\frac{1}{4}$ in. pipe.	$\frac{3}{4}$ in.	$2\frac{1}{2}$ in. Cyl., 40 ft.	Wallow	\$5.50
4	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	3 " 40 "	Wallpie	6.00
5	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	$3\frac{1}{2}$ " 40 "	Wallroc	6.50

Cylinders like Figs. 609, 611, 613, 616 or 619 (pages 82 to 86) are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.

# GOULDS "NEW STAR" WELL LIFT PUMP STANDARD.

WITH REVOLVING TIGHT TOP AND SOLID BASE.

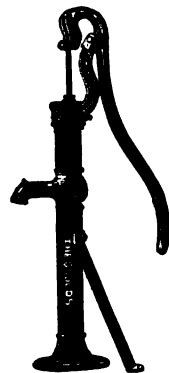


FIG. 850.

Fig. 850 represents our "New Star" Well Pump Standard, with revolving tight top, polished rod and links above, and solid base. This Pump is especially desirable for public places, for the tight top precludes the possibility of stones or sticks being thrown into Pump.

Always tapped near the spout for sizes of wrought-iron pipe given below, although we can fit for  $1\frac{1}{2}$  or 2 inch, if so ordered.

FIG. 850. SIZES, PRICES, ETC.

No.	Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
3	6 in.	$1\frac{1}{4}$ in. pipe.	$\frac{3}{4}$ in.	$2\frac{1}{2}$ in. Cyl., 40 ft.	Walrut	\$6.25
4	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	3 " 40 "	Walrvu	6.75
5	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	$3\frac{1}{2}$ " 40 "	Walt	7.25

Cylinders like Figs. 609, 611, 613, 616 or 619 (pages 82 to 86) are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.



# GOULDS WELL LIFT PUMP STANDARD.

WITH SOLID BEARER AND BASE.

Fig. 486 represents our Well Lift Pump Standard for deep or shallow wells. The very strong bearer top and long and heavy lever will adapt this Standard for wells of more than ordinary depth, and it is sometimes used over very deep wells. The Standard is tapped for wrought-iron pipe near the spout.

We can fit for 1½ or 2 inch pipe if so ordered, but always fit for 1¼-inch unless otherwise directed.

FIG. 486. SIZE, PRICE, ETC.

Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
8 in.	1¼ in. pipe.	7-16 in.	{ 2¼ in. Cyl., 75 ft. } 3 " " 50 " }	Harm	\$6.00

Cylinders like Figs. 609, 611, 613, 616 or 619 (pages 82 to 86) are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.



FIG. 486.

# GOULDS WELL LIFT PUMP STANDARD AND CYLINDER.

FOR DEEP OR SHALLOW WELLS.

Under Fig. 559 we arrange our Fig. 845 Well Lift Pump Standard with our Fig. 559½ Deep Well Cylinder surmounted with an air chamber. The effect of this air chamber above the Cylinder is to relieve it and the entire connecting pipe and Standard of the usual jerk and strain common in pumping water from deep wells, and at the same time supplying a steadier stream at the discharge. When ordered we can fit up this Standard and Cylinder with the necessary connecting pipe and rods for wells of any depth.

FIG. 559. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
4. 8	3 in. 4 "	6 in. 6 "	.18 gal. .33 "	1¼ in. pipe. 1½ "	7-16 in. 7-16 "	40 ft. 30 "	Lava Lawless	\$12.00 18.00

\* Depth of wells to which Pumps may be adapted by lowering Cylinders to within 15 or 20 feet of water, or total lift and force from supply to point of delivery.



FIG. 559.

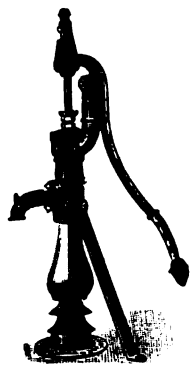


FIG. 236.

## GOULDS DEEP WELL LIFT PUMP STANDARD.

WITH TIGHT TOP GUIDE.

Fig. 236 represents our Heavy Deep Well Lift Pump Standard, with tight top, for wells up to 100 feet deep. The Standard is bolted together near the spout with an intermediate flange, which will be found a great convenience in making pipe and rod connections. Fig. 236 has been a great favorite with the Trade for years. It is built for every-day indiscriminate use. Any size pipe from 1¼-inch to 2-inch can be used with this Standard, but always fitted for 1¼-inch unless otherwise ordered.

FIG. 236. SIZE, PRICE, ETC.

Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
7 in.	1¼ in. pipe.	7-16 in.	{ 2½ in. Cyl., 100 ft. 3 " 60 "	Cane	\$10.00

Cylinders like Figs. 613, 616, 619, 548, etc. (pages 82 to 87), are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water ; smaller Cylinders in proportionately deeper wells.

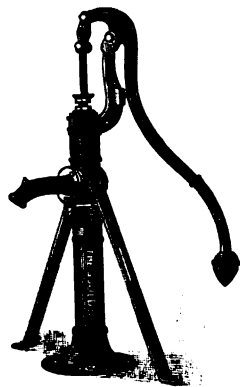


FIG. 592.

## GOULDS DEEP WELL LIFT PUMP STANDARD.

WITH TIGHT TOP GUIDE.

The cut accurately represents our Heavy Deep Well Lift Pump Standard. The manner of construction in two sections, with flange between, is plainly visible, and will be esteemed a very great convenience by those who have to set up these Pumps. It is very strong and heavy, has balanced handle, and will answer to use on wells from 100 to 200 feet deep.

Any size from 1¼-inch to 2½-inch pipe can be used with this Standard, but always fitted as below unless ordered otherwise.

FIG. 592. SIZE, PRICE, ETC.

Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
7 in.	1½ in. pipe.	7-16 in.	{ 2½ in. Cyl., 150 ft. 3 " 100 "	Milled	\$16.00

Cylinders like Figs. 613, 616, 619, 548, etc. (pages 82 to 87), are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water ; smaller Cylinders in proportionately deeper wells.

# GOULDS "NEW STAR" WELL FORCE PUMP STANDARD.

WITH REVOLVING TOP AND SOLID BASE.

Fig. 853 represents our admirable "New Star" Well Force Pump Standard arranged with tight top, polished rod and links above. In this Standard the air chamber is made by enlarging stock at the top.

All these Standards are tapped for pipe near the spout. Each one has an outlet back of the spout for attaching pipe, and the spout is provided with hose tube and nut to screw on, and not with a clap-trap of a clamp.

Always tapped as below unless otherwise ordered.

FIG. 853. SIZES, PRICES, ETC.

No.	Stroke.	Suction.	Discharges.	Well Rod.	* Lift and Force.	Cipher.	Price.
1	6 in.	1 1/4 in. pipe.	1 1/4 in. pipe and 3/4 in. hose.	7-16 in.	2 1/2 in. Cyl., 60 ft.	Washa	\$10.00
2	6 "	1 1/4 " "	1 1/4 " " 3/4 "	7-16 "	3 " " 45 "	Washabl	11.00

Cylinders like Figs. 609, 611, 613, 616 or 619 (pages 82 to 86) are required with this Pump Standard and cost extra.

\*Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

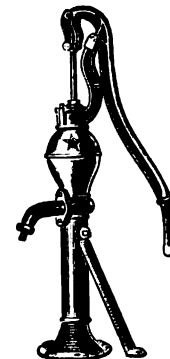


FIG. 853.

# GOULDS "NEW STAR" WELL FORCE PUMP STANDARD.

WITH REVOLVING TOP AND COCK SPOUT.

This is the same Force Pump Standard in all respects as our Fig. 853, more fully described above, except that it has a cock spout. When pipe is connected to the opening behind the spout, there must be some means for closing the spout opening, and a cock does this. Thus one Pump may be made to supply water at the house, or any part of the premises as well.

The Standards are always tapped for pipe near the spout, as below, unless otherwise ordered.

FIG. 883. SIZES, PRICES, ETC.

No.	Stroke.	Suction.	Discharges.	Well Rod.	* Lift and Force.	Cipher.	Price.
1	6 in.	1 1/4 in. pipe.	1 1/4 in. pipe and 1/2 in. hose.	7-16 in.	2 1/2 in. Cyl., 60 ft.	Washbal	\$12.50
2	6 "	1 1/4 " "	1 1/4 " " 1/2 "	7-16 "	3 " " 45 "	Washbow	13.50

Cylinders like Figs. 609, 611, 613, 616 or 619 (pages 82 to 86) are required with this Pump Standard and cost extra.

\*Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

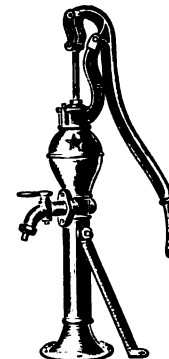


FIG. 883.

# "NORTHERN STAR" WELL FORCE PUMP STANDARD.

WITH REVOLVING TOP AND SOLID BASE.



FIG. 855.

Fig. 855 represents our "Northern Star" Force Pump Standard with air chamber on spout, tight top and polished rod and links above. It is simple in construction, strong and compact, and offers good value for a Pump of this class at the low price at which we are able to sell it.

It is tapped near the spout for sizes of wrought-iron pipe given in our table below, although it could be changed if desired.

FIG. 855. SIZE, PRICE, ETC.

Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	Clpher.	Price.
6 in.	1¼ in. pipe.	1¼ in. pipe and ¾ in. hose.	7-16 in.	{ 2½ in. Cyl., 60 ft. } 3 45 "	Washer.	\$11.00

Cylinders like Figs. 609, 611, 613, 616, 619, etc. (pages 82 to 86) are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.

# GOULDS "STAR" WELL FORCE PUMP STANDARD.

WITH REVOLVING TOP AND SOLID BASE.



FIG. 857.

Fig. 857 is another of our favorite Well Force Pump Standards, arranged with our new Force Pump top, and is preferred by many at an increased cost to Standards having the air chamber in the stock. This Standard is a little heavier than the one described above.

The gas pipe is connected in the body close under the spout, and either 1, 1¼, 1½ or 2 inch can be used if so ordered, but always fitted as below unless otherwise directed. We *cannot* fit this Standard with 2½-inch pipe. On the extremity of spout we place a coupling and tube for hose.

FIG. 857. SIZE, PRICE, ETC.

Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	Clpher.	Price.
6 in.	1¼ in. pipe.	1¼ in. pipe and ¾ in. hose.	7-16 in.	{ 2½ in. Cyl., 100 ft. } 3 60 "	Washing	\$12.00

Cylinders like Figs. 609, 611, 613, 616 or 619 (pages 82 to 86) are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.

# GOULDS DEEP WELL FORCE PUMP STANDARD.

WITH AIR CHAMBER ON SPOUT.

**Fig. 237** represents our Deep Well Force Pump Standard with sectional construction, etc., and the addition of an air chamber on the spout. There is a half-hose coupling and tube for attaching hose on the spout.

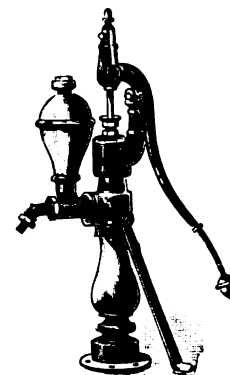
Always fitted for 1¼-inch pipe unless ordered to the contrary, but we can fit them for 1½ or 2 inch pipe when desired.

**FIG. 237. SIZES, PRICES, ETC.**

Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	Cipher.	Price.
7 in.	1¼ in. pipe.	1¼ in. pipe and 1 in. hose.	7-16 in.	2½ in. Cyl., 100 ft. / 3 " 60 "	Cannon	\$13.00

*Cylinders* like **Figs. 613, 616, 619, 548**, etc. (on pages 82 to 87), are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.



**FIG. 237.**

# GOULDS DEEP WELL FORCE PUMP STANDARD.

WITH AIR CHAMBER AND COCK SPOUT.

**Fig. 887** represents our **Fig. 237**, Deep Well Force Pump Standard, described above, arranged with cock spout in air chamber; closing this cock allows discharge to pass through top of air chamber. A hose coupling can be screwed on end of cock for attaching hose.

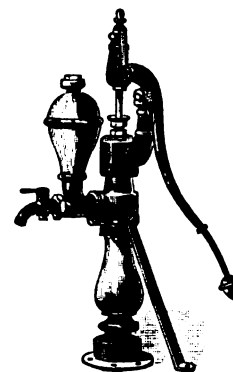
Always fitted for 1¼-inch pipe unless ordered to the contrary, but we can fit them for 1½ or 2 inch pipe when so desired.

**FIG. 887. SIZE, PRICE, ETC.**

Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	Cipher.	Price.
7 in.	1¼ in. pipe.	1¼ in. pipe and 1 in. hose.	7-16 in.	2½ in. Cyl., 100 ft. / 3 " 60 "	Cape	\$15.50

*Cylinders* like **Figs. 613, 616, 619, 548**, etc. (pages 82 to 87), are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.



**FIG. 887.**

# GOULDS DEEP WELL FORCE PUMP STANDARD.

WITH AIR CHAMBER ON SPOUT.



FIG. 593.

The cut represents our Heavy Deep Well Force Pump Standard. It has sectional standard, tight top with polished rod and links above, heavy balanced lever and two supporting braces adapting it for hard duty. Always fitted for 1½-inch pipe unless otherwise ordered, but we can fit them for pipe up to 2½ inches. Table gives complete data.

FIG. 593. SIZES, PRICES, ETC.

No.	Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	Cipher.	Price.
1	7 in.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	7-16 in.	2½ in. Cyl., 150 ft.	Milt	\$20.00
2	Same as No. 1	with cock spout.		7-16 "	3 " " 100 "	Milton	22.50

Cylinders like Figs. 613, 616, 619, 548, etc. (pages 82 to 87), are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# GOULDS DEEP WELL FORCE PUMP STANDARD.

WITH BRAKE TOP AND WOOD LEVERS.



FIG. 763.

The cut represents our Heavy Deep Well Force Pump Standard, arranged with brake top, so that either one or two men can operate Pump. Intermediate flange below spout is of considerable convenience in making pipe connections. Standard has two supporting braces.

Always fitted for 1½-inch pipe unless otherwise ordered, but we can fit them for pipe up to 2½ inches.

FIG. 763. SIZES, PRICES, ETC.

No.	Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	Cipher.	Price.
1	7 in.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	7-16 in.	2½ in. Cyl., 150 ft.	Waterag	\$21.00
2	Same as above	with cock spout.		7-16 "	3 " " 100 "	Waterbu	23.50

Cylinders like Figs. 613, 616, 619, 548, etc. (pages 82 to 87), are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# GOULDS MANUAL AND POWER PUMPING APPARATUS.

WITH TIGHT AND LOOSE PULLEYS.

This apparatus consists of iron bed with vertical column, which supports shaft with tight and loose pulleys, crank handle and face plate, these operating pitman and connecting rod (working through usual stuffing box) suitable for welding to plunger rod of pump cylinder in well. This can be worked by either manual or other power supplied from steam, gas or petroleum engine, if belt speed is not too high. Can tap suction for 1½-in. or 2-in. pipe, but always as below unless otherwise ordered.

FIG. 872. SIZE, PRICE, ETC.

Stroke.	Suction.	Discharge.	Well Rod.	Pulleys, Each.	* Lift and Force.	Cipher.	Price.
4, 5 or 6 in.	1½ in. pipe.	1½ in. pipe.	¾ in.	15 x 3 in.	{ 2½ in. Cyl., 50 ft. } 3 40 "	Waxlight	\$25.00

Cylinders like Figs. 613, 616, 548 (pages 82 to 87), or Figs. 514½, 1047 (pages 76 and 77), are required with this Pumping Apparatus and *cost extra*.

\* Depth of wells to which Pumping Apparatus may be adapted by placing Cylinder within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

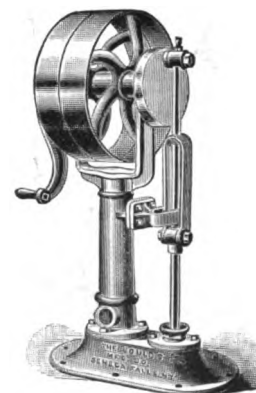


FIG. 872.

## GOULDS MANUAL PUMPING APPARATUS.

WITH HEAVY FLY-WHEEL AND WINCH HANDLE.

This apparatus consists of heavy cast-iron bed plate and column supporting wrought-iron shaft with round rim, fly-wheel affixed, face plate, steel wrist pin, pitman, guided connecting rod passing through stuffing box in bed plate and thence inside pipe connecting with pump cylinder below. It is strongly bolted together and offers a very effective and simple apparatus for raising water from wells. As shown, water is discharged through spout, but by substituting a flange for spout it can be piped to convey the water any distance.

FIG. 547. SIZE, PRICE, ETC.

Stroke.	Suction.	Discharge.	Well Rod.	Fly-Wheel.	* Lift and Force.	Cipher.	Price.
5, 6 or 7 in.	1½ in. pipe.	{ 1½ in. pipe and } 1 in. hose.	¾ in.	36 in.	{ 2½ in. Cyl., 75 ft. } 3 60 "	Lamp	\$39.00

Cylinders like Figs. 613, 616, 548 (pages 82 to 87), or Figs. 514½, 1047 (pages 76 and 77), are required with this Pumping Apparatus and *cost extra*.

\* Depth of wells to which Pumping Apparatus may be adapted by placing Cylinder within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

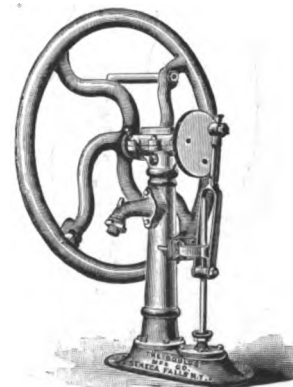


FIG. 547.



FIG. 889.

## GOULDS POWER PUMPING APPARATUS.

WITH TIGHT AND LOOSE PULLEYS.

Fig. 889 has the same base, standard, face plate, pitman, stuffing box, etc., as on our other Pumps of this type, but the distinguishing feature is the tight and loose pulley for belt transmission. A spout with air chamber like that on Fig. 888, see page 55, may be used if desired, or a gas-pipe flange for lateral or vertical distribution of water.

FIG. 889. SIZE, PRICE, ETC.

Stroke.	Suction.	Discharge.	Well Rod.	Pulleys Each.	* Lift and Force.	Cipher.	Price.
5, 6 or 7 in.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	¾ in.	20 X 3 in.	{ 2½ in. Cyl., 75 ft. } 3 " " " 60 " }	Warper	\$44.00

Cylinders like Figs. 613, 616, 548 (pages 82 to 87), or Figs. 514½ and 1047 (pages 76 and 77), are required with this Pumping Apparatus, and *cost extra*.

\* Depth of wells to which Pumping Apparatus may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

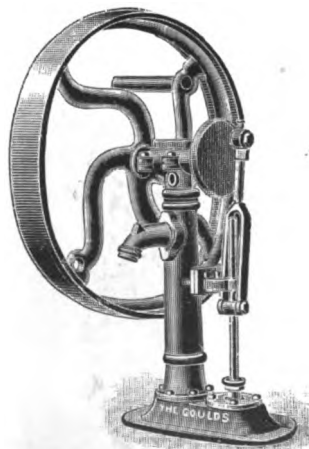


FIG. 547½.

## MANUAL AND POWER PUMPING APPARATUS.

WITH PULLEY FLY-WHEEL.

Fig. 547½ is the same in all respects as Fig. 547 (page 54), but with flat rim fly-wheel to be worked by manual power, or belt transmission from any of the numerous and well known gas or steam engines, under proper speed conditions. By substituting a flange for spout, pipe may be connected to convey water wherever desired.

FIG. 547½. SIZE, PRICE, ETC.

Stroke.	Suction.	Discharge.	Well Rod.	Pulley Fly-Wheel.	* Lift and Force.	Cipher.	Price.
5, 6, or 7 in.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	¾ in.	36 X 4½ in.	{ 2½ in. Cyl., 75 ft. } 3 " " " 60 " }	Lane	\$41.00

Cylinders like Figs. 613, 616, 548 (pages 82 to 87), or Figs. 514½ and 1047 (pages 76 and 77), are required with this Pumping Apparatus, and *cost extra*.

\* Depth of wells to which Pumping Apparatus may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.



# GOULDS POWER PUMPING APPARATUS.

WITH TIGHT AND LOOSE PULLEYS.

Fig. 589 represents our Pumping Apparatus for power only. The pinion shaft is made extra heavy and long enough to carry tight and loose pulleys, the size of which can be changed to meet any special requirements. An out-board bearing is not essential for the ordinary range of service, but in some cases it may be advantageous. Gear and pinion are all best steel with machine-cut teeth. Gas, steam, oil or electric power may be employed to operate these pumps.

FIG. 589. SIZES, PRICES, ETC.

Stroke.	Suction.	Well Rod.	Geared.	Pulleys Each.	* Lift and Force.	Cipher.	Price.
6 in.	1½ in. pipe.	¾ in.	3 to 1	20 x 3 in.	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ in. Cylinder, 125 feet.} \\ 3 \text{ " " " 100 " " } \\ 3\frac{1}{2} \text{ " " " 60 " " } \end{array} \right.$	Warping Warplume Warproof	\$68.00 71.00 73.00
Same as above with air chamber.							
Same as above with air chamber and cock spout.							

Cylinders like Figs. 613, 616, 548 (pages 82 to 87), or Figs. 514½, 1047 (pages 76 and 77), are required for this Pumping Apparatus and *cost extra*.

\* Depth of wells to which Pumping Apparatus may be adapted by placing Cylinder within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

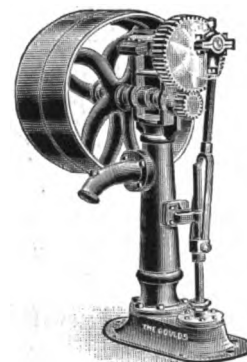


FIG. 589.

# GOULDS MANUAL AND POWER PUMPING APPARATUS.

WITH GEAR AND PINION.

Fig. 888 shows our Manual and Power Pumping Apparatus with gear and pinion, and cock spout with air chamber on same. The main gear and pinion are made of best steel with machine-cut teeth, well-fitted, bright finished, and work with minimum friction. Water can be forced upward through top of air chamber or drawn through the spout.

Deduct \$2.00 from price given below, when cock is not furnished.

FIG. 888. SIZE, PRICE, ETC.

Stroke.	Suction fitted for	Well Rod.	Geared.	Pulley Fly-Wheel.	* Lift and Force.	Cipher.	Price.
6 in.	1½ in. pipe.	¾ in.	3 to 1	36 x 4½ in.	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ in. Cylinder, 125 feet.} \\ 3 \text{ " " " 100 " " } \\ 3\frac{1}{2} \text{ " " " 60 " " } \end{array} \right.$	Vexil	\$70.00

Cylinders like Figs. 613, 616, 548 (pages 82 to 87), or Figs. 514½, 1047 (pages 76 and 77), are required with this Pumping Apparatus, and *cost extra*.

\* Depth of wells to which Pumping Apparatus may be adapted by placing Cylinder within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

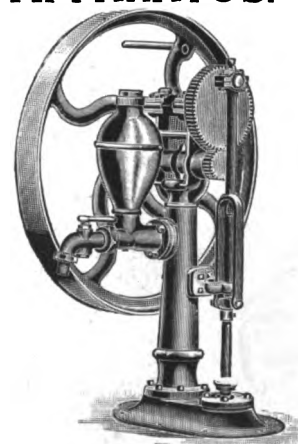
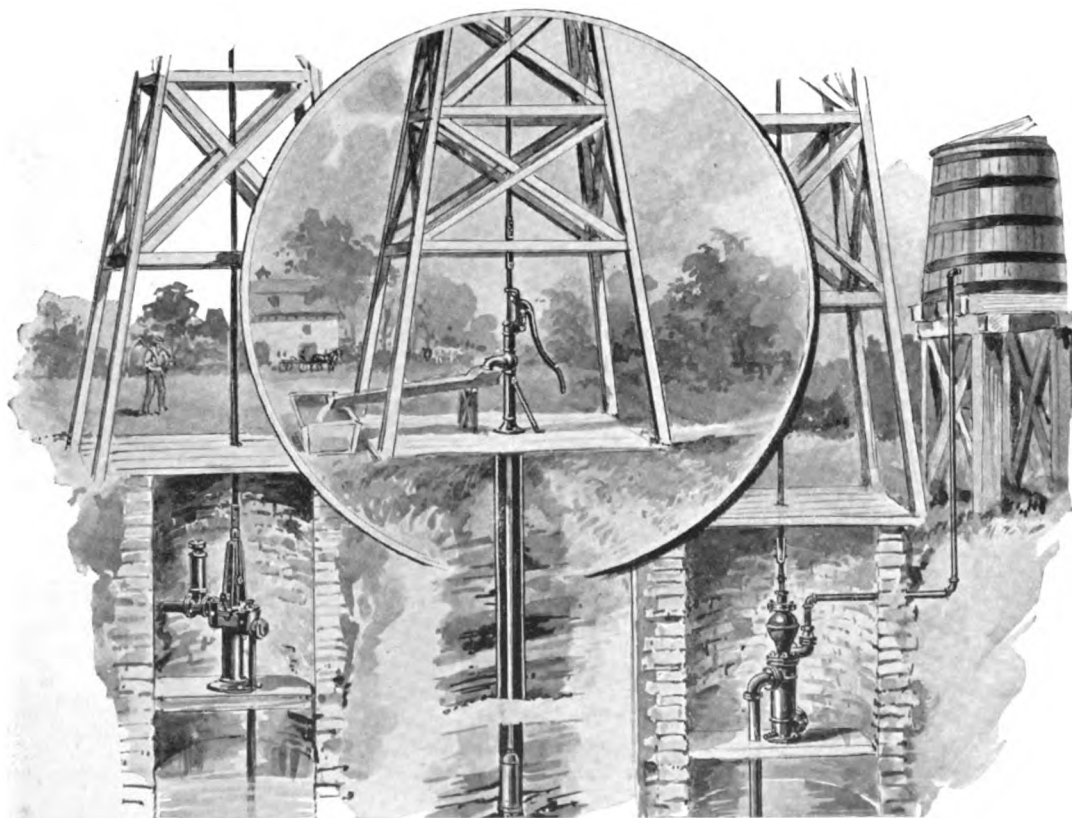


FIG. 888.



Probably no greater labor-saving and useful device has ever been invented than the Wind Mill or Engine, as they are sometimes called, and perhaps their greatest usefulness is in pumping water for the house, barn, stock, irrigation, etc., etc. To the left, in open shallow well, is Fig. 1002 Double-Acting Force Pump, which is of great capacity and especially adapted for irrigation, or large water supply, and which in warm climates may be placed over shallow well, dug, driven or bored. This Pump will be found, page 78.

In the centre is Fig. 762 Lift Pump Standard, operating Fig. 616 Pump Cylinder in drilled and cased well. Pump Standard will be found, page 59, and Cylinder, pages 85 and 86.

To the right is Fig. 514 1/2 "Syphon" Well Force Pump (page 76) in open well, discharging to elevated tank. The application of these and our many other styles of Wind Mill Pumps are almost limitless. This class of Pumps and Cylinders will be found, pages 59 to 87.

# POSSIBILITIES IN UTILIZING THE POWER OF THE WIND.

By G. D. HISCOX, M. E.

(*Iron Age, New York.*)

WE quote the following, which we believe of special interest to users of Wind Mill Pumps : —

## “ HORSE POWER OF WIND MILLS.”

“ The horse-power of Wind Mills of the best construction is as the proportional squares of their diameters and inversely as their velocities ; for example, a 10-foot mill in a 16-mile breeze will develop 0.15 horse-power at 65 revolutions per minute. A 20-foot mill with the same breeze and at 40 revolutions per minute will develop 1 horse-power.

“ A 25-foot mill, 35 revolutions,  $1\frac{3}{4}$  horse-power.

“ A 30-foot mill, 28 revolutions,  $3\frac{1}{2}$  horse-power.

“ A 40-foot mill, 22 revolutions,  $7\frac{1}{2}$  horse-power.

“ A 50-foot mill, 18 revolutions, 12 horse-power.

“ The increase in power from increase in velocity of the wind is equal to the square of the proportional velocity ; as for example, the 25-foot mill rated above for a 16-mile wind, will, with a 32-mile wind, have its horse-power increased by  $\frac{32}{16} = 2^2 = 4 \times 1\frac{3}{4} = 7$  horse-power ; a 40-foot mill in a 32-mile wind will run up to 30 horse-power, and a 50-foot mill to 48 horse-power, with a small deduction for increased friction of air on the wheel and machinery.

“ The modern mill of medium and large size will run and produce work in a 4-mile breeze, becoming very efficient in an 8 to 16-mile breeze, and increase its power with safety to the running gear up to a gale of 45 miles per hour.

“ It has been often asserted that one of the great drawbacks to the general use of Wind Mills for other than the exclusive pumping of water is the fact that when most needed the wind is at fault. This may be ever so true, but the fact that they have been so used for centuries and are largely now in use for milling purposes does

not make them of less value in view of the storage of 24 hours' work of the wind for a 6 to 10 hours' output of power at the required time.

"For mechanical work that can be carried on only during the ordinary ten-hour day this becomes a serious inconvenience; but as such power is always available from 5 to 8 hours and often 12 hours in the 24, a means of storage and transmission of power from the natural source of power at any time to the time and distance required for use should be the proper recourse for rescuing an intermitting power from this difficulty, and thus make possible a uniform power of 10 hours from an intermitting power of 24 hours."

**Approximate Quantities of Water delivered per Hour at different Elevations by Goulds Single-Acting Pump Cylinders operated by Wind Mills or Engines.**

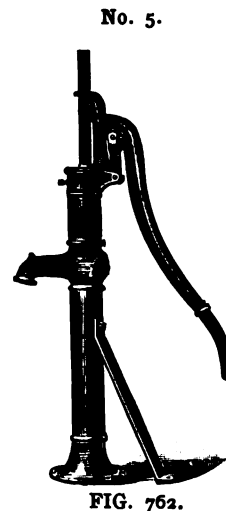
Diameter of Mill.	Maximum Revolutions per Minute.	25 FEET ELEVATION.			50 FEET ELEVATION.			100 FEET ELEVATION.		
		Dia. Pump Cyl.	Stroke.	Gallons per Hour.	Dia. Pump Cyl.	Stroke.	Gallons per Hour.	Dia. Pump Cyl.	Stroke.	Gallons per Hour.
8 ft.	50	2½ in.	4 in.	255	2 in.	4 in.	162	1½ in.	4 in.	90
10 "	45	3 "	6 "	459	3 "	6 "	460	2½ "	6 "	330
12 "	40	5 "	6 "	1,200	3½ "	6 "	600	3 "	6 "	460
14 "	35	6 "	6 "	1,500	4 "	6 "	682	3½ "	6 "	600

**Approximate Quantities of Water delivered per Hour at different Elevations by Goulds Double-Acting Pump Cylinders operated by Wind Mills or Engines.**

Diameter of Mill.	Maximum Revolutions per Minute.	25 FEET ELEVATION.			50 FEET ELEVATION.			100 FEET ELEVATION.		
		Dia. Pump Cyl.	Stroke.	Gallons per Hour.	Dia. Pump Cyl.	Stroke.	Gallons per Hour.	Dia. Pump Cyl.	Stroke.	Gallons per Hour.
12 ft.	40	4 in.	10 in.	2,400	4 in.	8 in.	2,000	3 in.	8 in.	1,200
14 "	35	5 "	12 "	4,200	4 "	10 "	2,100	3 "	12 "	1,575
16 "	35	5 "	15 "	5,280	5 "	8 "	2,730	4 "	8 "	1,825
18 "	30	6 "	14 "	6,000	5 "	12 "	3,400	4 "	12 "	2,400
20 "	30	6 "	18 "	7,800	6 "	12 "	4,500	5 "	12 "	3,600

# GOULDS "NEW STAR" WELL LIFT PUMP STANDARDS.

WITH REVOLVING TOP FOR MANUAL AND WIND POWER.



Our new line of Well Pump Standards with Wind Mill tops, as shown above, contain all the advantages suggested by the most recent practice, and will be found to be the best of the kind made by any manufacturer. They are tapped for pipe near the spout, have supporting brace, and are a most suitable Standard every way. We can fit the 6-inch or 10-inch stroke Pumps for  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  or 2 inch pipe, as ordered, but always fit as below, unless otherwise directed. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod. We do not send wind mill slides except when specially ordered.

FIG. 762. SIZES, PRICES, ETC.

Stroke.	Suction.	Well Rod.	* Lift.	No. 3.		No. 4.		No. 5.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
6 in. 10 "	$1\frac{1}{4}$ in. pipe. 2 " "	7-16 in. 7-16 and 1 in.	( $2\frac{1}{2}$ in. Cyl., 100 ft. 3 " " " 60 "	Vauntfr . . . .	\$7.00 . . . .	Vauntful Veader	\$7.50 9.00	Vauntin Veal	\$8.00 9.50

*Cylinders like Figs. 609, 611, 613, 616 or 619 (pages 82 to 86) are required with this Pump Standard and cost extra.*

\* Depth of wells to which Pump Standards may be adapted by placing Cylinders within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.

# GOULDS NEW WELL LIFT PUMP STANDARD.

WITH REVOLVING TOP. FOR MANUAL OR WIND POWER.

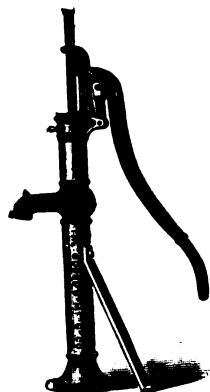


FIG. 1032.

Fig. 1032 represents our new Well Lift Pump Standard with Wind Mill Top. The design and construction of this Pump are in line with the best goods of this class. Standards are tapped for pipe near the spout, and have supporting brace. We can fit 6-inch or 10-inch stroke pumps for 1¼, 1½ or 2 inch pipe, as ordered, but always fit as below unless otherwise directed. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod. We do not send wind mill slides except when specially ordered.

FIG. 1032. SIZES, PRICES, ETC.

Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
6 in. 10 "	1¼ in. pipe. 2 "	7-16 in. 7-16 and 1 in.	{ 2½ in. Cyl., 40 ft. 3 " " 30 "	Dreaded Dreadic	\$6.50 8.00

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.

## "STAR" WELL LIFT PUMP STANDARD.

WITH REVOLVING TOP. FOR MANUAL OR WIND POWER.



FIG. 412.

Fig. 412, Wind Mill Pump Standard, may be used over wells up to 150 feet deep. The Standard is in two sections, bolted together just below the spout. Between the two sections is interposed a flange into which the connecting pipe is screwed. These flanges are all of a size and drilled exactly alike, so that they will interchange and can be cut for either 1¼, 1½, 2 or 2½ inch wrought-iron pipe. Always fitted as below unless otherwise directed. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod. We do not send wind mill slides unless specially ordered.

FIG. 412. SIZES, PRICES, ETC.

Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
6 in. 10 "	1¼ in. pipe. 2 "	7-16 in. 7-16 and 1 in.	{ 2½ in. Cyl., 100 ft. 3 " " 60 "	Lain Laird	\$10.00 11.50

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.

# GOULDS WELL LIFT PUMP STANDARD.

WITH SWELL TOP AND SOLID BASE.

**Fig. 1055** represents our Wind Mill Lift Pump Standard with swell top, adapted to drilled or tubular wells. The peculiar advantage of this formation of top is that it prevents the water from splashing out, as is sometimes the case when pumping very fast with other standards. Standard is provided with revolving bearer and has guided rod. Tapped near the spout for wrought-iron connecting pipe, which may be  $1\frac{1}{4}$ ,  $1\frac{1}{2}$ , 2, or  $2\frac{1}{2}$  inches, but always  $1\frac{1}{4}$  inches unless otherwise ordered. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod. Wind mill slides are not furnished unless specially ordered.

**FIG. 1055. SIZES, PRICES, ETC.**

Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
6 in. 10 "	$1\frac{1}{4}$ in. pipe. 2 " pipe.	7-16 in. 7-16 "	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ in. Cyl., 100 ft.} \\ 3 \text{ " " 60 " } \end{array} \right.$	Figast Figaub	\$8.00 9.50

*Cylinders* like **Figs. 611, 613, 616, 619**, etc. (pages 82 to 86), are required with this Pump Standard, and *cost extra*.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.



**FIG. 1055.**

## GOULDS WELL LIFT PUMP TOP AND BASE.

FOR TUBULAR WELLS.

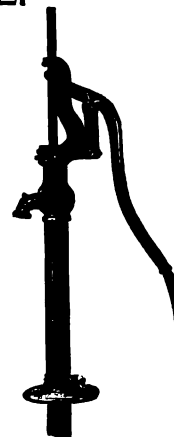
**Fig. 1056** represents a Wind Mill Lift Pump Top and Base, adapted for tubular wells, or where cylinder is formed inside wrought-iron pipe. The stock is formed principally by the tubular well pipe, which is connected immediately under the spout. This pipe may be 2,  $2\frac{1}{2}$  or 3 inches in diameter, but we invariably fit standard for 2-inch pipe unless otherwise ordered. The base may be attached to pipe at any desired point and thus the standard may be raised and lowered to suit convenience. Pumps have coupling for 1-inch wood rod.

**FIG. 1056. SIZES, PRICES, ETC.**

Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
6 in. 10 "	2 in. pipe. 2 " pipe.	7-16 and 1 in. 7-16 " 1 "	$\left\{ \begin{array}{l} 1\frac{1}{2} \text{ in. Cyl., 150 ft.} \\ 2 \text{ " " 100 " } \end{array} \right.$	Figate Figava	\$7.00 8.50

For Tubular Well Valves for use with above, see **Fig. 967**, page 294.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.



**FIG. 1056.**

# GOULDS "STAR" WELL LIFT PUMP STANDARD.

## ADJUSTABLE STROKE.

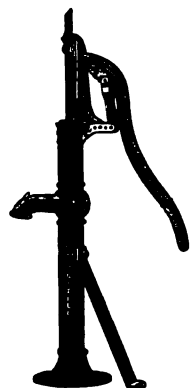


FIG. 780.

Fig. 780 represents our Adjustable Stroke Pump Standard with wind mill top, and is particularly adapted to all kinds of drilled or tubular wells, and whose working barrels are formed inside of 2-inch pipe.

This Pump can be changed to 6, 8 and 10 inch stroke to suit the length of cylinder and amount of water required.

The stock is tapped inside the barrel immediately below the spout for 2-inch pipe, unless otherwise ordered; and if a Standard is wanted for larger than 2-inch pipe we can arrange our Fig. 412 (page 60), with variable top at extra list price. Pumps have coupling for 1-inch wood rod.

Wind mill slides are not furnished unless specially ordered.

FIG. 780. SIZES, PRICES, ETC.

Stroke.	Suction.	Well Rod.	* Lift.	No. 4.		No. 5.	
				Cipher.	Price.	Cipher.	Price.
6, 8 or 10 in.	2 in. pipe.	7-16 and 1 in.	{ 2½ in. Cyl., 100 ft. } 3 " 60 "	Tomer	\$9.50	Tomeda	\$10.00

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water.

# GOULDS DEEP WELL LIFT PUMP STANDARD.

## FOR MANUAL OR WIND POWER.

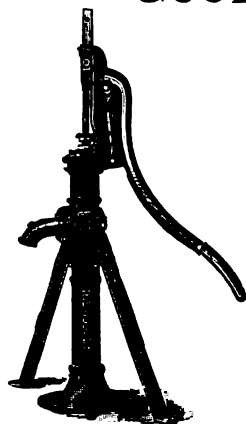


FIG. 764.

Fig. 764 represents one of our best known Extra Heavy Deep Well Pump Standards, being bolted together underneath the spout, with intermediate flange, and arranged with wind mill top. It is the strongest and best built Standard ever offered to the Trade, and for Wind Mill use is admirably adapted for heavy and constant work. They are successfully used on wells from 100 to 200 feet deep.

Any size from 1½-inch to 2½-inch pipe can be used with this Standard, but always fitted as below unless otherwise ordered. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod.

Wind mill slides are not furnished unless specially ordered.

FIG. 764. SIZES, PRICES, ETC.

Stroke.	Suction.	Well Rod.	* Lift.	Cipher.	Price.
6 in. 10 "	1½ in. pipe. 2 "	7-16 in. 7-16 and 1 in.	{ 2½ in. Cyl., 150 ft. } 3 " 100 "	Valise Valley	\$17.00 18.50

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water; smaller Cylinders in proportionately deeper wells.



# GOULDS "NEW STAR" WELL FORCE PUMP STANDARD.

WITH REVOLVING TOP. FOR MANUAL OR WIND POWER.

We make two sizes, Nos. 1 and 2, of the "New Star" Wind Mill Force Pump Standards, and believe they combine all the necessary requirements of a Pump of this kind at a moderate price. Air chamber is formed by enlarging stock at the top.

All these Standards are tapped for pipe near the spout. Each one has an outlet back of the spout for attaching pipe; the spout is provided with hose tube and nut to screw on, and not with a clap-trap of a clamp.

Always tapped as below unless otherwise ordered. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod. Wind mill slides are not sent unless specially ordered.

FIG. 422. SIZES, PRICES, ETC.

Stroke.	Suction.	Discharges.	Well Rod.	* Lift and Force.	No. 1.		No. 2.	
					Cipher.	Price.	Cipher.	Price.
6 in. 10 "	1 1/4 in. pipe. 2 "	1 1/4 in. pipe and 3/4 in. hose. 1 1/4 " " " 3/4 "	7-16 in. 7-16 and 1 in.	{ 2 1/2 in. Cyl., 100 ft. 3 " " " 60 "	Vehemen Vehicled	\$10.00 11.50	Vehicl Veil	\$11.00 12.50

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 85 to 86), are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.



FIG. 422.

# GOULDS "NEW STAR" WELL FORCE PUMP STANDARD.

WITH REVOLVING TOP AND COCK SPOUT. FOR MANUAL OR WIND POWER.

This is the same Wind Mill Force Pump Standard in all respects as our Fig. 422, more fully described above, except that it has a cock spout. When pipe is connected to the opening behind the spout, there must be some means for closing the spout opening, and a cock does this. The nose of cock is cut gas-pipe thread and is furnished with hose coupling.

The Standards are always tapped for pipe near the spout, as below, unless otherwise ordered. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod. Wind mill slides are not sent unless specially ordered.

FIG. 423. SIZES, PRICES, ETC.

Stroke.	Suction.	Discharges.	Well Rod.	* Lift and Force.	No. 1.		No. 2.	
					Cipher.	Price.	Cipher.	Price.
6 in. 10 "	1 1/4 in. pipe. 2 "	1 1/4 in. pipe and 3/4 in. hose. 1 1/4 " " " 3/4 "	7-16 in. 7-16 and 1 in.	{ 2 1/2 in. Cyl., 100 ft. 3 " " " 60 "	Veina Veinles	\$12.50 14.00	Veined Veinly	\$13.50 15.00

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

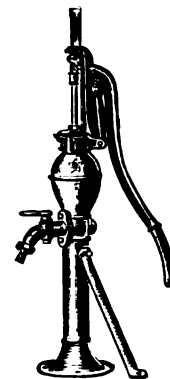


FIG. 423.

# GOULDS "STAR" WELL FORCE PUMP STANDARD.

WITH AIR CHAMBER ON SPOUT. FOR MANUAL OR WIND POWER.

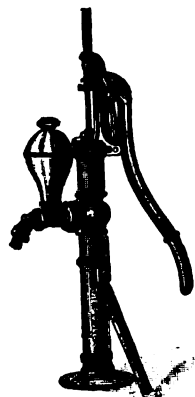


FIG. 401.

Fig. 401 represents one of our best forms of Wind Mill Force Pumps, with revolving top, and while not one of the cheapest, possesses features which will commend it to practical men.

The gas-pipe is connected in the body, close under the spout, and either 1, 1½, 1¾ or 2 inch can be used if so ordered, but always fitted as below unless otherwise directed. We cannot fit this standard for 2½-inch pipe. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod.

Wind mill slides are not furnished unless specially ordered.

FIG. 401. SIZES, PRICES, ETC.

Stroke.	Suction.	Discharges.	Well Rod.	* Lift and Force.	Cipher.	Price.
6 in. 10 "	1¼ in. pipe. 2 "	1¼ in. pipe and ¾ in. hose. 1¼ " " " ¾ "	7-15 in. 7-16 and 1 in.	{ 2½ in. Cyl., 100 ft. 3 " " " 60 "	Meat Meek	\$13.00 14.50

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# GOULDS "STAR" WELL FORCE PUMP STANDARD.

WITH AIR CHAMBER ON SPOUT. FOR MANUAL OR WIND POWER.

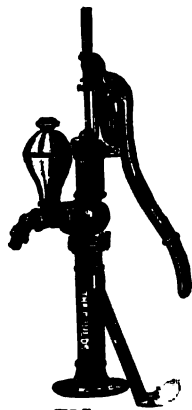


FIG. 402.

Fig. 402 is similar in appearance and construction to Fig. 401, described above, except the Standard is built in two sections, with intermediate flange, which is a great convenience in making pipe connections near the spout.

The intermediate flange can be cut for any size of pipe up to and including 2½-inch, but always shipped as below unless otherwise ordered. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod.

Wind mill slides are not furnished unless specially ordered.

FIG. 402. SIZES, PRICES, ETC.

Stroke.	Suction.	Discharges.	Well Rod.	* Lift and Force.	Cipher.	Price.
6 in. 10 "	1¼ in. pipe. 2 "	1¼ in. pipe and ¾ in. hose. 1¼ " " " ¾ "	7-15 in. 7-16 and 1 in.	{ 2½ in. Cyl., 100 ft. 3 " " " 60 "	Minec Mint	\$13.50 15.00

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with this Pump Standard and cost extra.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# GOULDS "SOUTHERN" WELL FORCE PUMP STANDARD.

WITH COCK SPOUT. FOR MANUAL OR WIND POWER.

This Wind Mill Force Pump Standard has the intervening flange inserted just above the base. There is a check valve underneath the air chamber, so that these Standards are only adapted to warm climates. The flanges can be screwed for any size of pipe up to and including 3 inches. The upper discharge of air chamber is always fitted for pipe and the nose of the cock for hose. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod. Wind mill slides are not furnished unless specially ordered. Fitted as below unless otherwise directed.

FIG. 413. SIZES, PRICES, ETC.

Stroke.	Suction.	Discharges.	Well Rod.	* Lift and Force.	Cipher.	Price.
6 in. 10 "	1½ in. pipe. 2 "	1½ in. pipe and 1 in. hose. 1½ " " 1 "	7-16 in. 7-16 and 1 in.	{ 2½ in. Cylinder, 100 ft. 3 " " 60 "	Roads Roand	\$15.50 17.00

Cylinders like Figs. 611, 613, 616 and 619, etc. (pages 82 to 86), are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

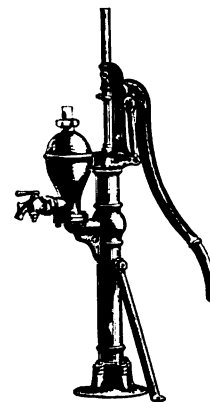


FIG. 413.

# GOULDS DEEP WELL FORCE PUMP STANDARD.

FOR MANUAL OR WIND POWER.

Fig. 765 represents our new Wind Mill Deep Well Force Pump Standard of extra heavy pattern, and constructed in two sections with flange between. This last feature is considered a very great advantage by all who put up these Pumps, for by a change of flanges they can readily be fitted for any size from 1½ to 2½ in. gas-pipe, thus readily adapting them for every need. Pumps tapped for 2-inch pipe have coupling for 1-inch hose. Always fitted as below unless otherwise ordered. Wind mill slides are not sent unless specially ordered.

FIG. 765. SIZES, PRICES, ETC.

Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	Cipher.	Price.
6 in. 10 "	1½ in. pipe. 2 "	1½ in. pipe and 1 in. hose. 1½ " " 1 "	7-16 in. 7-16 and 1 in.	{ 2½ in. Cylinder, 150 ft. 3 " " 100 "	Vellum Valor	\$21.00 22.50

Cylinders like Figs. 611, 613, 616 and 619, etc. (pages 82 to 86), are required with this Pump Standard and *cost extra*.

\* Depth of wells to which Pump Standard may be adapted by placing Cylinder within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

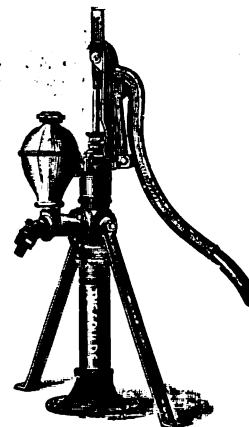


FIG. 765.

## GOULDS ANTI-FREEZING WIND MILL FORCE PUMPS.



OUR Anti-Freezing Windmill Force Pumps, with Regulator, represent the acme of economic pumping, and it is difficult to conceive how a more complete labor-saving device can be produced. The position of supply tank, the system of piping, etc., is something that the conditions and requirements will determine. The adaptations and uses of these Pumps are almost limitless and can only be suggested by our sketch.

A wind mill pumping plant like the above is complete and self-contained, requires no attendance and almost no care. The working of the regulator is such that the Pump is automatically started and

stopped, as the water may fall or rise in the tank. 69; other Pumps of similar class, pages 67 and 68.

We illustrate this type of Pump under **Fig. 1061**, page

# GOULDS ANTI-FREEZING WELL FORCE PUMP HEADS.

WITH PATENT VERTICAL SHIFTING VALVE AND SCREW HANDLE. FOR MANUAL OR WIND POWER.

Fig. 1033 represents our new Anti-Freezing Wind Mill Force Pump Heads with 2-inch air chamber pipe, vertical distributing valve and brass elbow attachment at bottom inlet.

In these Pumps we have embodied all the best features of Pumps in this class, intending that they shall displace our other types. The distributing valve is placed in lower working head beyond the reach of frost, and is opened and closed by turning the wheel above stuffing box in discharge piece. This valve and working parts may be examined and repaired by withdrawing discharge pipe through platform base. By removing cap of lower working head and plate on platform, a 2-inch or 2½-inch plunger can be drawn up and repaired without removing Pump from the well.

Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod.

Fig. 1045 is practically the same as Fig. 1033, and is arranged with Fig. 616, Brass Body Cylinder, as ordered, screwed into lower working head, thus adapting it in this form for shallow wells of 30 feet depth.

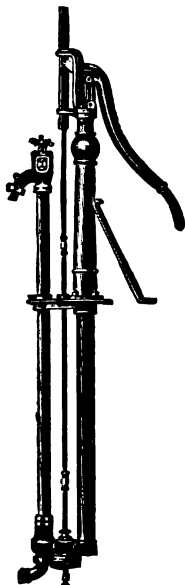


FIG. 1033.

FIG. 1033. SIZES, PRICES, ETC.

Stroke.	Suction.	Lower Discharge.	Upper Discharge.	Well Rod.	Cipher.	Price.
6 in.	1½ in. pipe.	1 in. pipe.	¾ in. hose.	7-16 in.	Asleep	\$18.00
10 "	2 " "	1 " "	¾ " "	7-16 and 1 in.	Aslopel	19.50
Adjustable } 6, 8 or 10 in. }	2 " "	1 " "	¾ " "	7-16 " 1 "	Awlwort	20.50

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with Fig. 1033, and cost extra.

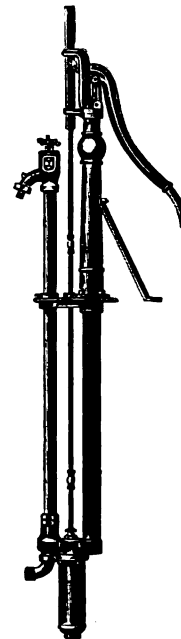


FIG. 1045.

FIG. 1045. SIZES, PRICES, ETC.

Stroke.	Brass Body Cylinder.	Suction.	Lower Discharge.	Upper Discharge.	* Lift and Force.	Cipher.	Price.
6 in.	2½ x 10½ in.	1½ in. hose.	1 in. pipe.	¾ in. hose.	125 ft.	Bonair	\$26.00
10 "	2½ x 14 " "	1½ " "	1 " "	¾ " "	75 "	Bonanza	30.00
Adjustable } 6, 8 or 10 in. }	2½ x 14 " "	1½ " "	1 " "	¾ " "	75 "	Bonbon	31.00

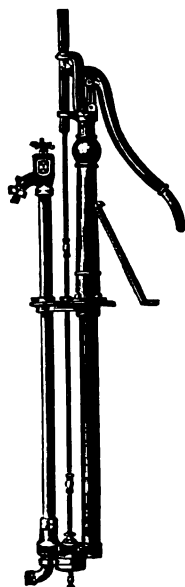
\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

# GOULDS ANTI-FREEZING WELL FORCE PUMP HEADS.

WITH PATENT VERTICAL SHIFTING VALVE AND SCREW HANDLE, FOR MANUAL OR WIND POWER.

**Fig. 1031** represents our new Anti-Freezing Wind Mill Force Pump Head, with 1½-inch air chamber pipe, vertical distributing valve and brass elbow attachment at bottom outlet. This distributing valve is placed in lower working head beyond the reach of frost, and is opened and closed by turning the wheel above stuffing box in discharge piece. The valve and working parts may be examined and repaired by withdrawing discharge pipe through platform base. By removing cap on lower working head and plate on platform, a 2-inch or 2½-inch plunger can be drawn up and repaired without removing pump from well. Pumps tapped for 2-inch pipe have coupling for 1-inch wood rod.

**Fig. 1048** is the same as **Fig. 1031**, but arranged with **Fig. 616** Brass Body Cylinder. Fitted in this manner, Pump may be used in wells up to 30 feet in depth.

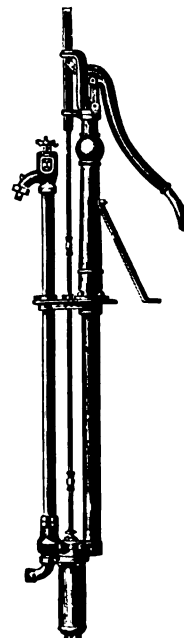


**FIG. 1031.**

**FIG. 1031. SIZES, PRICES, ETC.**

Stroke.	Suction.	Lower Discharge.	Upper Discharge.	Well Rod.	Cipher.	Price.
6 in. 10 " Adjustable, } 6, 8 or 10 in. }	1¼ in. pipe. 2 "	1 in. pipe. 1 " 1 "	¾ in. hose. ¾ " ¾ "	7-16 in. 7-16 and 1 in. 7-16 " 1 "	Aslake Aslant Awless	\$17.00 18.50 19.50

*Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with Fig. 1031 and cost extra.*



**FIG. 1048.**

**FIG. 1048. SIZES, PRICES, ETC.**

Stroke.	Brass Body Cylinder.	Suction.	Lower Discharge.	Upper Discharge.	* Lift and Force.	Cipher.	Price.
6 in. 10 " Adjustable, } 6, 8 or 10 in. }	2½ x 10½ in. 2½ x 14 " 2½ x 14 "	1¼ in. pipe. 1¼ " 1¼ "	1 in. pipe. 1 " 1 "	¾ in. hose. ¾ " ¾ "	125 ft. 75 " 75 "	Bonce Boncila Bondhol	\$25.00 29.00 30.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

# GOULDS REGULATOR FORCE PUMP HEAD.

WITH VERTICAL SHIFTING VALVE AND LOCK HANDLE FOR MANUAL OR WIND POWER.

Wheel in operation.

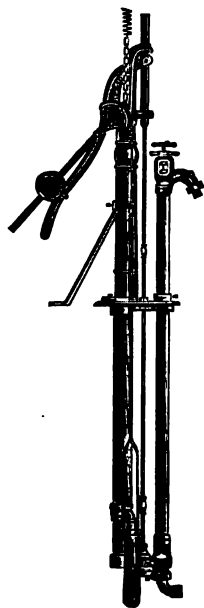


FIG. 1061.

**Fig. 1061** Regulator Force Pump Head (shown to the left when wheel is in operation and to the right when wheel is held out of gear) is a modification of our **Fig. 1033** Anti-Freezing Force Pump Head, more fully described page 67, to which we refer. In operation, the Regulator controls automatically the Wind Mill. The arrangement is such that when the supply tank is full a common float valve closes inlet to tank and the discharge is forced into hydraulic cylinder, shown raised in engraving to the left. By this operation the hydraulic cylinder is forced down, as shown in engraving to the right, carrying with it the connecting rod and chain, actuating the cam or chain sheave above, which in turn, by connecting wire, throws mill out of gear. As the water in the tank may lower, the inlet in pipe is re-opened and the operation reversed. The advantages of this automatic control can hardly be overestimated. It should not be forgotten that Pump works only when tank requires filling, and thus saves the wear and tear of Pumps run indiscriminately. Pumps have coupling for 1-inch wood rod.

Wheel held out of gear.

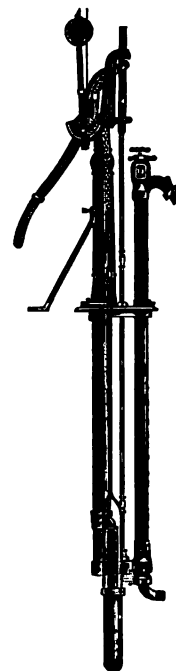


FIG. 1061.

FIG. 1061. SIZE, PRICE, ETC.

Adjustable Stroke.	Suction.	Lower Discharge.	Upper Discharge.	Well Rod.	* Lift and Force.	Clipher.	Price.
6, 8 or 10 in.	2 in. pipe.	1 in. pipe.	3/4 in. hose.	7-16 and 1 in.	2 1/2 in. Cyl., 125 ft. / 3 85 "	Chicaw	\$30.00

*Cylinders* like **Figs. 611, 613, 616 and 619** (pages 82 to 86) are required with this Pump Head and *cost extra*.

\*Depth of Well to which Pump may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# GOULDS WELL FORCE PUMP WORKING HEADS.

FOR MANUAL OR WIND POWER.

Figs. 685 and 690, Well Force Pump Working Heads, have revolving tops, sectional bases, fitted for 1, 1½, 2 or 2½ inch pipe as ordered. Under style of Fig. 815 we give prices below on a Working Head similar to Fig. 690, but larger, heavier, and stronger every way. Working Heads tapped for 2-inch pipe have coupling for 1-inch wood rod.

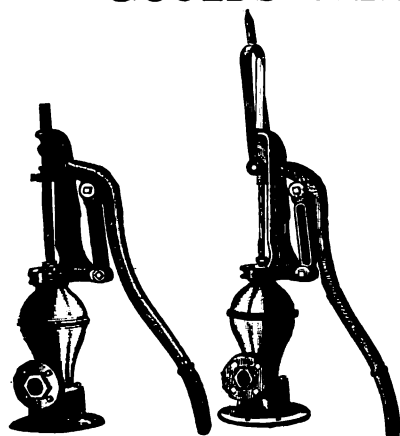


FIG. 685.

FIG. 690.

## SIZES, PRICES, ETC.

Fig.	Suction.	Discharge.	Well Rod.	* Lift and Force.	6-IN. STROKE.		10-IN. STROKE.	
					Cipher.	Price.	Cipher.	Price.
685	1¼ in. pipe.	1¼ in. pipe.	7-16 and 1 in.	2½ in. Cyl., 100 ft.	Sashaa	\$13.00	Sate	\$14.50
690	1¼	1¼	7-16 " 1 "	3 " 60 "	Topap	17.00	Topman	18.50
815	1½ "	1½ "	1 in.	2½ " 150 "	"	"	Waterdo	45.00
				3 " 100 "	"	"		

Cylinders like Figs. 613, 616, 619, etc. (pages 82 to 86), are required with these Working Heads and *cost extra*.

\* Depth of wells to which Working Heads may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

# GOULDS WELL FORCE PUMP PACKING-BOX HEADS.

FOR WIND MILLS.

We represent herewith our several styles Wind Mill Packing-Box Heads with brass glands and brass cased rods. Fig. 707 is provided with ½-inch rod coupling at top and 7-16 inch rod coupling at bottom. Fig. 1007 represents an all brass Packing-Box Head for open or drilled wells. The discharge is formed by screwing a tee in suction pipe below. This, however, is not included in our price.

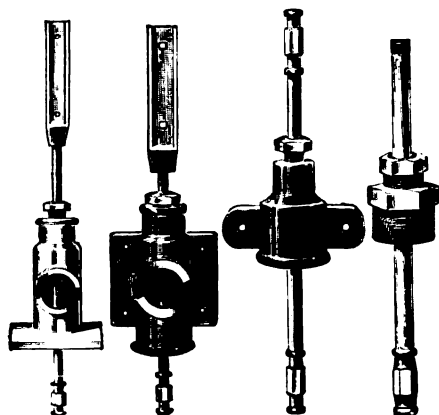


FIG. 216. FIG. 217. FIG. 707. FIG. 1007.

Fig.	Pipe.	Well Rod.	8 INCH STROKE.		10 INCH STROKE.		12 INCH STROKE.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
215	{ 1¼ in.	7-16 in.	Volumed	\$4.00	Ditch	\$5.00	Diveless	\$6.00
	{ 1½ or 2 in.	7-16 "	Bondato	5.00	Boxfish	6.25	Brimles	7.50
217	{ 1¼ "	7-16 "	Volumist	4.00	Ditching	5.00	Dodging	6.00
	{ 1½ or 2 "	7-16 "	Brimmed	5.00	Brimmin	6.25	Brimsto	7.50
1007	{ 1¼ "	¾ in.	Bandala	3.50	Bander	3.75	Bandyx	4.00
	{ 1½ "	" "	Bandand	4.75	Bandesos	5.00	Baneca	5.25
	{ 2 "	" "	Bandbox	5.75	Bandfis	6.00	Baneful	6.25
	{ 2½ "	" "	Bandeau	6.50	Bandits	6.75	Bangle	7.00
	{ 3 "	½ "	Bandeale	7.50	Bandog	7.75	Banish	8.00
707	{ 1 "	7-16 and ¾ in.	Birch	3.00	"	"	"	"
	{ 1¼ "	7-16 " ½ "	Bluster	3.00	"	"	"	"
	{ 1½ "	7-16 " ½ "	Vividly	3.25	"	"	"	"
	{ 2 "	7-16 " ½ "	Vividne	3.50	"	"	"	"

Cylinders like Figs. 611, 613, 616, 619, etc. (pages 82 to 86), are required with these Packing-Box Heads, and *cost extra*.



## GOULDS ARTESIAN WELL WORKING HEAD.

Fig. 446 shows a Working Head provided with piston rod, stuffing box, guide, guide rod, pitman and stub end, for operating Fig. 904 Artesian Pump Cylinder (see pages 88 and 89) or other long stroke Working Barrels.

This Pump Head may be operated by any machine power and is connected to cylinder by pipe and rod of sufficient length to reach to the bottom of the well or mine.

We can furnish everything complete for wells of any depth.

Always specify size suction and discharge pipe.

FIG. 446. SIZES, PRICES, ETC.

Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	Cipher.	Price.
16 in.	2 to 5 in. pipe.	1½ to 2½ in. pipe.	For size iron or wood rod ordered.	2¾ in. Cyl., 400 ft.	Dingier	\$70.00
18 "	2 to 5 "	1½ to 2½ "		3¼ " 300 "	Direful	75.00
24 "	2 to 5 "	1½ to 2½ "		3½ " 225 "	Dished	80.00
30 "	2 to 5 "	1½ to 2½ "		3¾ " 150 "	Torsel	90.00
36 "	2 to 5 "	1½ to 2½ "			Tortvd	100.00

Cylinders like Figs. 613, 548, 904 (pages 82 to 88, etc.) are required with this Working Head and cost extra.

\* Depth of well to which Working Head may be adapted by placing Cylinder within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

## GOULDS ARTESIAN WELL WORKING HEAD.

WITH DOUBLE ROD GUIDE AND POWER CONNECTION.

Fig. 979 represents our new Deep Well Working Head, especially designed to use with our Artesian Pump Cylinders. The piston rod is kept in perfect alignment by the double guides at side, while the stuffing box below adapts it for forcing equally as well as raising water. The power attachment is hinged and made to fit the wood rod of Wind Mill, though it may be readily adapted for any other power and connecting rod. By providing outlet in Head we dispense with expense and annoyance of lower tee discharge common in other types. Wood rod coupling *not* included in prices given below.

FIG. 979. SIZES, PRICES, ETC.

No.	Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	Cipher.	Price.
1	16 in.	2, 2½ or 3 in. pipe.	1, 1½ or 1½ in. pipe.	For size iron or wood rod ordered.	2½ in. Cyl., 300 ft.	Carving	\$15.00
2	24 "	3½, 4 or 4½ "	1½, 2 or 2½ "		4¼ " 250 "	Casing	25.00
2	30 "	3½, 4 or 4½ "	1½, 2 or 2½ "		4¼ " 250 "	Cavity	30.00
3	24 "	5 or 6 in. pipe.	2½ or 3 in. pipe.		5¾ " 200 "	Chained	30.00
3	30 "	5 or 6 "	2½ or 3 "		5¾ " 200 "	Chasmy	35.00
3	36 "	5 or 6 "	2½ or 3 "		5¾ " 200 "	Chiefly	40.00

See pages 88 and 89 for Fig. 904 Brass Artesian Pump Cylinder to use with this Head.

\* Depth of wells to which Working Heads may be adapted by placing Cylinders within 15 or 20 feet of water, or total lift and force from supply to point of delivery.

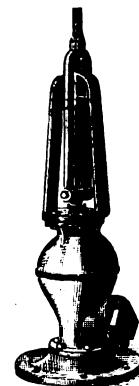


FIG. 446.

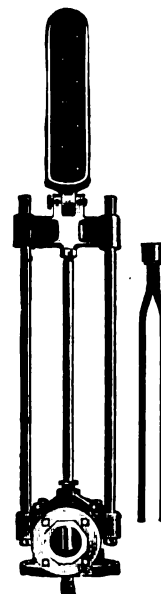


FIG. 979.

# GOULDS "PACIFIC" WELL FORCE PUMP.

FOR MANUAL OR WIND POWER.

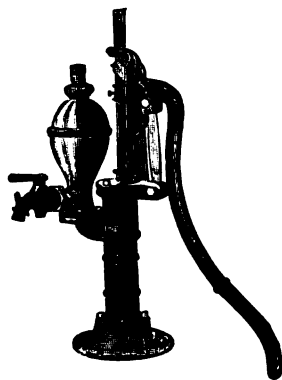


FIG. 674.

Fig. 674 represents our "Pacific" Well Force Pump on base, for hand or wind mill use. The Pumps have been upon the market for some years and are preferred above all others in certain localities. They are made in the very best manner and combine strength with graceful proportions. All are made with brass cased rods, brass stuffing box and valve seats, and provided with iron cocks with brass plugs. Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 674. (DRIQAB.) SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	* Lift and Force.	IRON.	BRASS CYL.	BRASS.
2	2½ in.	6½ in.	.14 gal.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	75 ft.	\$14.50	\$20.00	\$25.50
4	3 " "	6½ " "	.20 " "	1½ " "	1½ " " 1 " "	75 " "	16.50	21.50	37.50
6	3½ " "	6½ " "	.27 " "	1½ " "	1½ " " 1 " "	50 " "	24.00	32.00	46.00
8	4 " "	6½ " "	.35 " "	2 " "	1½ " " 1 " "	50 " "	25.50	38.50	55.50

\* Total lift and force from water to point of discharge, Pump not more than 25 feet above water.

# GOULDS "PACIFIC" WELL FORCE PUMP.

FOR MANUAL OR WIND POWER.

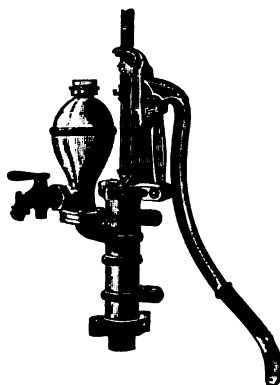


FIG. 601.

Fig. 601 represents our "Pacific" Well Force Pump with brackets, for hand or wind mill use. It is a strong and efficient Pump, having a brass cased rod and brass stuffing box and valve seats. We build this style of Pump of iron, or with cylinder and piston of brass, or entirely of brass except the lever, bearer and air chamber, while all are provided with iron cocks with brass plugs. Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 601. (DRIQACE.) SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	* Lift and Force.	IRON.	BRASS CYL.	BRASS.
2	2½ in.	6½ in.	.14 gal.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	75 ft.	\$14.50	\$20.00	\$25.50
4	3 " "	6½ " "	.20 " "	1½ " "	1½ " " 1 " "	75 " "	16.50	21.50	37.50
6	3½ " "	6½ " "	.27 " "	1½ " "	1½ " " 1 " "	50 " "	24.00	32.00	46.00
8	4 " "	6½ " "	.35 " "	2 " "	1½ " " 1 " "	50 " "	25.50	38.50	55.50

\* Total lift and force from water to point of discharge, Pump not more than 25 feet above the water.

# "PACIFIC" DOUBLE-ACTING WELL FORCE PUMP.

FOR MANUAL, WIND OR OTHER POWER.

Fig. 840 represents our new "Pacific" Double-Acting Force Pump with cock spout, arranged for either hand, wind or other power. It is strong and compactly built, the valves being under one plate in front. These valves are made of bronze, rubber faced, of an entirely new pattern, and we can recommend it for any place where water is within suction distance. Suction and discharge openings can be fitted for 1 1/4 or 2 inch pipes, but we always fit as below unless otherwise ordered.

Plugs are provided for emptying Pump in cold weather.

FIG. 840. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction Fitted for.	Discharges.	* Lift and Force.	IRON.		BRASS LINED.	
							Cipher.	Price.	Cipher.	Price.
2	2 1/2 in.	6 in.	.26 gal.	1 1/2 in. pipe.	1 1/4 in. pipe and 1 in. hose.	75 ft.	Warish	\$25.00	Wark	\$27.00
4	3 "	6 "	.37 "	1 1/2 "	1 1/2 " " 1 "	75 "	Warison	30.00	Warling	32.50
6	3 1/2 "	6 "	.50 "	2 "	1 1/2 " " 1 "	50 "	Casemate	37.50	Chestnut	40.00
8	4 "	6 "	.65 "	2 "	2 " " 1 "	50 "	Caseman	45.00	Clubfoot	48.00

\* Total lift and force from water to point of discharge, Pump not more than 25 feet above water.

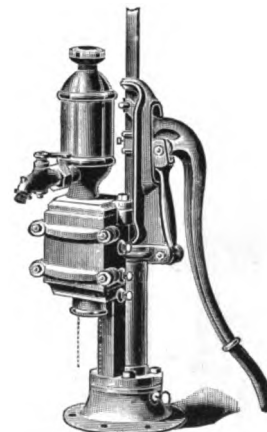


FIG. 840.

# "PACIFIC" DOUBLE-ACTING WELL FORCE PUMP.

FOR MANUAL, WIND OR OTHER POWER.

This cut shows a new and improved Double-Acting Force Pump, on plank, which can be connected to Wind Mill, or operated by hand power, as occasion requires. Its construction is essentially the same as Fig. 840 and our remarks on that Pump will apply to both.

We deduct \$1.50 from lists given below when an iron union with brass coupling is supplied instead of the cock, and \$3.50 where both cock and air chamber are not furnished. Nose of cock screwed for hose coupling.

FIG. 841. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	* Lift and Force.	IRON.		BRASS LINED.	
							Cipher.	Price.	Cipher.	Price.
2	2 1/2 in.	6 in.	.26 gal.	1 1/2 in. pipe.	1 1/4 in. pipe and 1 in. hose.	75 ft.	Warlock	\$25.00	Warm	\$27.00
4	3 "	6 "	.37 "	1 1/2 "	1 1/2 " " 1 "	75 "	Warly	30.00	Warmer	32.50
6	3 1/2 "	6 "	.50 "	2 "	1 1/2 " " 1 "	50 "	Crossing	37.50	Dabbing	40.00
8	4 "	6 "	.65 "	2 "	2 " " 1 "	50 "	Curb	45.00	Defest	48.00

\* Total lift and force from water to point of discharge, Pump not more than 25 feet above water.

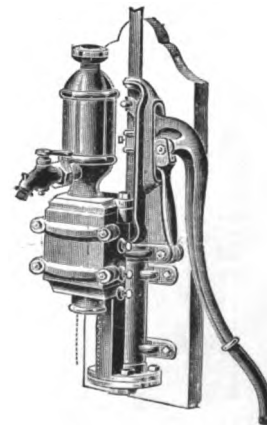


FIG. 841.

# GOULDS WELL FORCE PUMP.

WITH OSCILLATING STUB FOR WIND OR OTHER POWER.

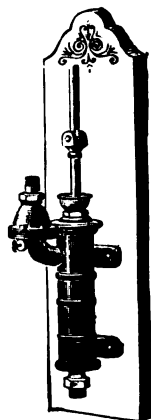


FIG. 265.

Fig. 265 shows a very complete and cheap Wind Mill Force Pump with brackets and plank, bowl gland, check valve, etc. This Pump can be used in dug wells of any depth, or in warm climates, over any style of well where water is not more than 25 feet distant. The shorter the suction-pipe on any pump can be, the easier it will work and the longer it will last and be less liable to get out of order.

Fitted for wrought-iron pipe as given in table, unless otherwise ordered.

FIG. 265. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	IRON.		BRASS.	
								Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.10 gal.	1 in. pipe.	1 in. pipe.	1/2 in. pipe.	50 ft.	Clasped	\$7.50	Clayed	\$19.00
2	2 1/2 "	7 "	.15 "	1 1/4 "	1 1/4 "	3/4 "	50 "	Class	9.00	Cleaned	20.00
4	3 "	7 "	.21 "	1 1/2 "	1 1/2 "	1 in. "	50 "	Claw	10.50	Clear	25.00
6	3 1/2 "	7 "	.29 "	1 3/4 "	1 3/4 "	1 1/4 "	40 "	Voic	16.00	Voidabl	30.00
8	4 "	7 "	.38 "	2 "	2 "	1 1/2 "	40 "	Voiced	18.00	Voidabl	40.00

\* Depth of wells in which Cylinders may be operated, or total lift and force from water to point of discharge, Pump not more than 25 feet above water.

# GOULDS WELL FORCE PUMP.

WITH OSCILLATING STUB FOR WIND OR OTHER POWER.

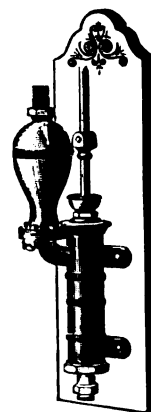


FIG. 266.

Fig. 266 is similar in appearance and construction to Fig. 265, given above, except it has an air chamber in place of check valve. It can be used for same purposes as that Pump and is better adapted for heavy lifts, as this air chamber relieves the discharge pipe of all pounding and produces a more uniform stream.

Fitted for wrought-iron pipe as given in table, unless otherwise ordered.

FIG. 266. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	Well Rod.	* Lift and Force.	IRON.		BRASS.	
								Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.10 gal.	1 in. pipe.	1 in. pipe.	1/2 in.	75 ft.	Clew	\$10.00	Cling	\$21.00
2	2 1/2 "	7 "	.15 "	1 1/4 "	1 1/4 "	3/4 "	75 "	Cliff	11.00	Clip	22.00
4	3 "	7 "	.21 "	1 1/2 "	1 1/2 "	1 in. "	75 "	Climb	12.50	Clock	27.00
6	3 1/2 "	7 "	.29 "	1 3/4 "	1 3/4 "	1 1/4 "	50 "	Climber	19.00	Cloak	33.00
8	4 "	7 "	.38 "	2 "	2 "	1 1/2 "	50 "	Climbing	21.00	Clong	43.00

\* Depth of wells in which Cylinders may be operated, or total lift and force from water to point of discharge, Pump not more than 25 feet above water.

# GOULDS DOUBLE-ACTING WELL FORCE PUMP.

FOR WIND MILL OR OTHER POWER.

Fig. 448 shows a Double-Acting Force Pump, with brackets, by many preferred for use with Wind Mills. The piston rod can be made with a stub end to *weld* on an additional rod or with a malleable coupling for *screwing* on the rod, as ordered. The smaller sizes are preferably employed on account of the small degree of power requisite, while the quantity of water obtained is equal to the capacity of a single-acting cylinder of much greater size.

FIG. 448. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	Well Rod.	* Lift and Force.	IRON.		BRASS.	
								Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.19 gal.	1½ in. pipe.	1½ in. pipe.	½ in.	60 ft.	Foxy	\$12.00	Fredy	\$25.00
1	2¼ "	7 "	.24 "	1½ "	1½ "	½ "	60 "	Frail	12.50	Free	26.00
2	2½ "	7 "	.29 "	1½ "	1½ "	½ "	60 "	Frame	15.50	Fresh	35.00
3	2¾ "	7 "	.36 "	1½ "	1½ "	½ "	60 "	Frank	17.00	Frety	42.00
4	3 "	7 "	.43 "	1½ "	1½ "	½ "	60 "	Fray	19.00	Friar	60.00
6	3½ "	7 "	.58 "	1½ "	1½ "	½ "	45 "	Freak	22.00	Frill	70.00
8	4 "	7 "	.76 "	2 "	2 "	¾ "	45 "	Fritted	38.00	Frisk	95.00

\* Depth of wells in which Cylinders may be operated, or total lift and force from water to point of discharge, Pump not more than 25 feet above water.

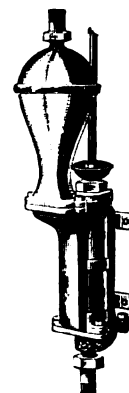


FIG. 448.

# "PACIFIC" DOUBLE-ACTING WELL FORCE PUMP.

FOR WIND MILL OR OTHER POWER.

Fig. 878 represents our "Pacific" Double-Acting Force Pump (described on page 73), arranged for other than manual power. This Pump may be used over wells of any description, and placed any reasonable distance down, in open or dug wells. It embodies all the good features of a Pump of this class. The suction pipe screws into a flange underneath the valve box and where there is no danger of freezing, a check valve at its extremity is recommended. Prices include either a forked rod for wood rod or harp connection for iron rod, as ordered.

FIG. 878. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.26 gal.	1½ in. pipe.	1½ in. pipe.	75 ft.	Warraop	\$25.00
4	3 "	6 "	.37 "	1½ "	1½ "	75 "	Warray	30.00
6	3½ "	6 "	.50 "	2 "	1½ "	50 "	Warren	37.50
8	4 "	6 "	.65 "	2 "	2 "	50 "	Warrenter	45.00

\* Depth of wells in which Pump may be operated, or total lift and force from water to point of discharge, Pump not more than 25 feet above water.

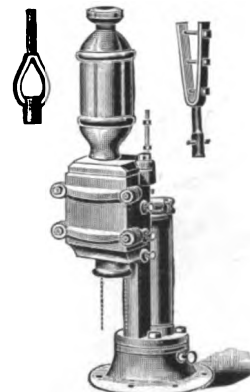


FIG. 878.

# GOULDS "SYPHON" WELL FORCE PUMP.

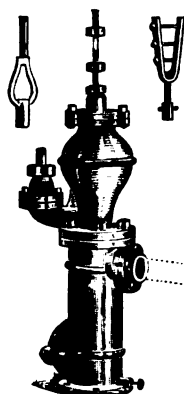


FIG. 514½.

In our "Syphon" Working Barrel, the water enters into the reservoir, or outer cylinder, filling it with water to that point. In this body of water the brass inner cylinder, provided with brass plunger, etc., is suspended, leaving suitable space between inner and outer walls and at bottom, the effect of which is that Pump is always primed and ready for use. Plunger and rod may be drawn through top of air chamber without breaking any pipe connections. Wood rod coupling or harp connection, as ordered, at \$1.50 extra list on sizes up to 4-inch, and \$2.50 extra list on larger sizes.

FIG. 514½. SIZES, PRICES, ETC.

Dia. Inner Cyl.	Suction and Discharge.	8 INCH STROKE.			10 INCH STROKE.			12 INCH STROKE.		
		Capacity per Stroke.	Cipher.	Price.	Capacity per Stroke.	Cipher.	Price.	Capacity per Stroke.	Cipher.	Price.
2 in.	1½ in. pipe.	.11 gal.	Basem	\$25.00	. . .	. . .	. . .	. . .	. . .	. . .
2½ "	1½ "	.17 "	Basidi	25.00	. . .	. . .	. . .	. . .	. . .	. . .
3 "	1½ "	.24 "	Basket	25.25	.30 gal.	Beardi	\$35.00	.37 gal.	Binder	\$42.50
3½ "	2 "	.33 "	Basketr	27.25	.42 "	Bearer	37.50	.50 "	Binding	45.00
4 "	2 "	.44 "	Basque	30.50	.54 "	Bearh	40.00	.65 "	Bindwe	50.00
4½ "	2½ "	. . .	. . .	.69 "	. . .	Bearho	45.00	.83 "	Binerva	55.00
5 "	2½ "	. . .	. . .	.85 "	. . .	Bearing	50.00	1.02 "	Binnac	60.00
6 "	3 "	. . .	. . .	1.22 "	. . .	Befall	64.00	1.47 "	Befit	78.00

# GOULDS "SYPHON" WELL FORCE PUMP.

Fig. 776½ represents "Syphon" Working Barrel described above, arranged with wind mill top and lever, for manual or wind power. Plunger and rod may be drawn through top of air chamber without breaking any pipe connections.

FIG. 776½. (DRIQBAN.) SIZES, PRICES, ETC.

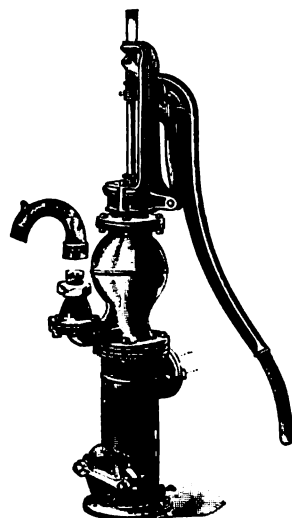


FIG. 776½.

Dia. Inner Cyl.	Suction and Discharge.	* Lift and Force.	8 INCH STROKE.		10 INCH STROKE.		12 INCH STROKE.	
			Capacity per Stroke.	Price.	Capacity per Stroke.	Price.	Capacity per Stroke.	Price.
2 in.	1½ in. pipe.	100 ft.	.11 gal.	\$28.50	. . .	. . .	. . .	. . .
2½ "	1½ "	100 "	.17 "	28.50	. . .	. . .	. . .	. . .
3 "	1½ "	100 "	.24 "	28.75	.30 gal.	\$40.00	.37 gal.	\$47.50
3½ "	2 "	100 "	.33 "	31.00	.42 "	42.50	.50 "	50.00
4 "	2 "	100 "	.44 "	34.50	.54 "	45.00	.65 "	55.00
4½ "	2½ "	75 "	. . .	. . .	.69 "	50.00	.83 "	60.00
5 "	2½ "	75 "	. . .	. . .	.85 "	55.00	1.02 "	65.00
6 "	3 "	75 "	. . .	. . .	1.22 "	70.00	1.47 "	83.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

# GOULDS "EVER READY" WELL FORCE PUMP.

FOR WIND MILL OR OTHER POWER.

Fig. 1047 shows our "Ever Ready" Force Pump for wind mill or other power. A reservoir is formed between inner and outer cylinders, which is always filled with water, so that Pump is continually primed and "ever ready" for use. A flanged top cap allows plunger to be removed from cylinder and quickly restored without breaking any pipe connections. A large hand-hole at the bottom opens to the lower valve.

Pump has brass cased rod, brass lined cylinder, brass plunger and valves, and wind mill slide.

FIG. 1047. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	Cipher.	Brass Lined.
2½ in.	8 in.	.17 gal.	1½ in. pipe.	1¼ in. pipe.	100 ft.	Cledab	\$25.00
3 " "	8 " "	.24 " "	1½ " "	1½ " "	100 " "	Cledic	25.25
2½ " "	12 " "	.26 " "	1½ " "	1½ " "	100 " "	Clefar	27.50
3 " "	12 " "	.37 " "	1½ " "	1¼ " "	100 " "	Cleggar	28.50
3½ " "	12 " "	.50 " "	2 " "	1½ " "	100 " "	Cleggho	30.00
4 " "	12 " "	.65 " "	2 " "	1½ " "	100 " "	Clegill	35.00

\* Depth of well to which Pump may be adapted, or total lift and force from water to point of discharge, Pump not more than 25 feet above water.

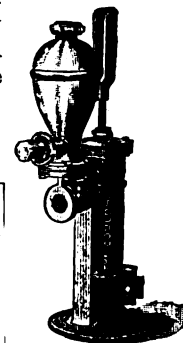


FIG. 1047.

# GOULDS "EVER READY" WELL FORCE PUMP.

FOR MANUAL OR WIND POWER.

Fig. 906 represents our "Ever Ready" Force Pump arranged for wind or manual power. This Pump has inner and outer cylinders and the space between them is always filled with water. Pump has brass inner cylinder, thus rendering it non-corrosive. Bearer top is revolving and has long handle, giving a powerful leverage.

FIG. 906. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	Cipher.	Price.
2½ in.	6 in.	.13 gal.	1½ in. pipe.	1¼ in.	100 ft.	Weetac	\$28.50
3 " "	6 " "	.18 " "	1½ " "	1½ " "	100 " "	Weever	28.75
3½ " "	10 " "	.42 " "	2 " "	1½ " "	100 " "	Whap	31.50
4 " "	10 " "	.54 " "	2 " "	1½ " "	100 " "	Whapper	34.50

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

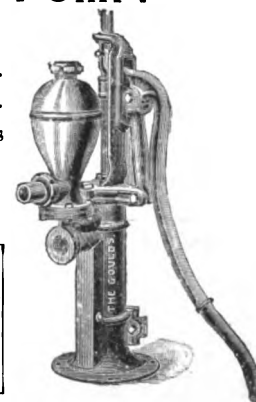


FIG. 906.

# DOUBLE-ACTING FORCE PUMPS.

FOR MANUAL OR MACHINE POWER.

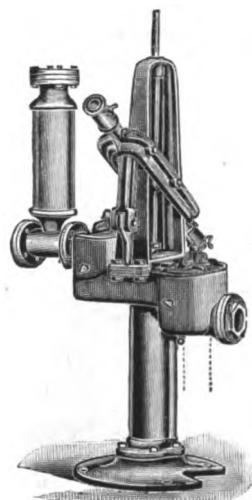


FIG. 1001.

Figs. 1001 and 1002 represent our Double-Acting Railroad Force Pumps, the former arranged with brake and wood handles for manual power, the latter with pitman and strap rod for wind mill or other power.

The cylinder, with suction and discharge valve chambers, is in one piece, to which the top is securely bolted. The valves and valve seats, with rubber discs and springs, are arranged in valve chambers on either side of cylinder under single clamp, rendering them easy of access. The brass cased rod is in one piece with forged cross-head. Suction and discharge may be piped vertically or horizontally, as desired.

It will be noticed we give below limit stroke, also safe working stroke, where operated by wind mill, etc.

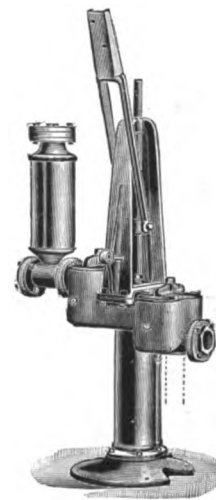


FIG. 1002.

FIG. 1001. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS LINED CYL.	
						Cipher.	Price.	Cipher.	Price.
3 in.	14 in. for 12 in. stroke mill.	.86 gal.	1½ in. pipe.	1½ in. pipe.	100 ft.	Zutam	\$50.00	Zutasi	\$58.00
3 "	18 " 16 " "	1.10 "	1½ " "	1½ " "	100 "	Zutak	60.00	Zutawz	67.00
4 "	14 " 12 " "	1.52 "	2½ " "	2 " "	100 "	Zutag	65.00	Zutatf	72.00
4 "	18 " 16 " "	1.96 "	2½ " "	2 " "	100 "	Zutare	70.00	Zutaxd	77.00

FIG. 1002. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS LINED CYL.	
						Cipher.	Price.	Cipher.	Price.
3 in.	14 in. for 12 in. stroke mill.	.86 gal.	1½ in. pipe.	1½ in. pipe.	100 ft.	Cluff	\$50.00	Colefu	\$58.00
3 "	18 " 16 " "	1.10 "	1½ " "	1½ " "	100 "	Clufgu	60.00	Colfal	67.00
4 "	14 " 12 " "	1.52 "	2½ " "	2 " "	100 "	Clufdol	65.00	Colegla	72.00
4 "	18 " 16 " "	1.96 "	2½ " "	2 " "	100 "	Clugge	70.00	Colfcy	77.00
5 "	18 " 16 " "	3.06 "	3 " "	2½ " "	100 "	Colhus	90.00	Cludul	100.00
5 "	26 " 24 " "	4.42 "	3 " "	2½ " "	100 "	Clugrug	115.00	Colgac	130.00
6 "	18 " 16 " "	4.41 "	3½ " "	3 " "	100 "	Coljam	125.00	Cludyx	140.00
6 "	26 " 24 " "	6.36 "	3½ " "	3 " "	100 "	Cluhag	150.00	Colgon	170.00
8 "	18 " 16 " "	7.83 "	5 " "	4 " "	75 "	Colkup	250.00	Clueky	275.00
8 "	26 " 24 " "	11.32 "	5 " "	4 " "	75 "	Colebro	275.00	Colhab	310.00

\* Total lift and force from supply to point of delivery, Pumps not more than 25 feet above water.



# "STAR" DOUBLE-ACTING RAILROAD FORCE PUMPS.

FOR MANUAL OR MACHINE POWER.

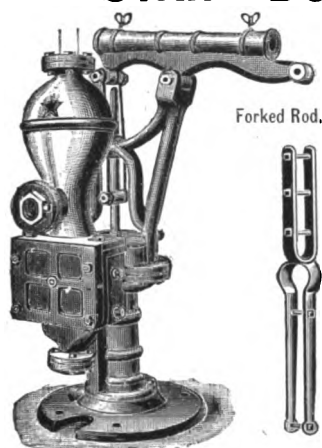


FIG. 338.

Figs. 338 and 339 represent our famous "Star" Double-Acting Railroad Force Pumps, specially designed for the use of distilleries, mills, railroad companies, etc. Briefly described: The Pump is exceptionally heavy and strong in casting, the plunger rod and solid cross-head are of bronze, while the valves (four in number) with their seats, are of the same metal, and grouped under valve cover in front. These valves are of a new type, calculated to develop greatest efficiency, and rubber faced, rendering them perfectly tight and relieving Pump of all pounding.

Fig. 338 is designed to be worked by wood levers, but can be arranged for power as well by substituting special Strap Rod for regular straps, at \$5.00 extra list.

Fig. 339 is the same Pump, which we build in larger sizes, with stub end for welding to connecting rod driven by any power, as steam or wind, working head, counter shaft, walking beam, etc., or with Forked Rod, at \$5.00 extra list.

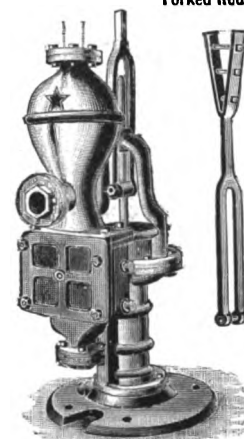


FIG. 339.

Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS LINED CYL.	
						Cipher.	Price.	Cipher.	Price.
3 in.	10 in. for 8 in. stroke mill.	.49 gal.	1½ in. pipe.	1½ in. pipe.	75 ft.	Ebon	\$65.00	Edge	\$72.00
4 "	10 " 8 "	.87 "	2 "	2 "	75 "	Echo	75.00	Edict	82.00
5 "	10 " 8 "	1.36 "	2½ "	2½ "	75 "	Eddy	90.00	Edify	97.00
6 "	10 " 8 "	1.96 "	3 "	3 "	75 "	Edend	120.00	Edited	130.00

FIG. 339. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	IRON.	Price.	BRASS LINED CYL.	Price.
3 in.	10 in. for 8 in. stroke mill.	.49 gal.	1½ in. pipe.	1½ in. pipe.	100 ft.	Educt	\$65.00	Elder	\$72.00
3 "	14 " 12 "	.73 "	1½ "	1½ "	100 "	Eject	78.00	Ella	90.00
4 "	10 " 8 "	.87 "	2 "	2 "	100 "	Eel	75.00	Elect	82.00
4 "	12 " 10 "	1.09 "	2 "	2 "	100 "	Eidly	95.00	Elking	105.00
4 "	14 " 12 "	1.31 "	2 "	2 "	100 "	Ekela	101.00	Elms	115.00
4 "	10 " 8 "	1.36 "	2½ "	2½ "	100 "	Egg	90.00	Elfed	97.00
5 "	14 " 12 "	2.04 "	2½ "	2½ "	100 "	Eland	120.00	Elogy	135.00
5 "	17 " 15 "	2.55 "	2½ "	2½ "	100 "	Elate	135.00	Elong	150.00
5 "	20 " 18 "	3.06 "	2½ "	2½ "	100 "	Elapse	170.00	Elastic	180.00
6 "	10 " 8 "	1.96 "	3 "	3 "	100 "	Elder	120.00	Elite	130.00
6 "	16 " 14 "	3.43 "	3 "	3 "	100 "	Elbow	175.00	Elope	190.00
6 "	20 " 18 "	4.41 "	3 "	3 "	100 "	Eldate	225.00	Elsen	250.00
7 "	14 " 12 "	4.00 "	4 "	4 "	75 "	Elderly	260.00	Eldern	285.00
7 "	16 " 14 "	4.66 "	4 "	4 "	75 "	Elding	275.00	Eldorad	300.00
7 "	20 " 18 "	6.00 "	4 "	4 "	75 "	Elapsot	300.00	Elapsut	330.00
8 "	14 " 12 "	5.22 "	5 "	5 "	75 "	Electio	300.00	Electer	330.00
8 "	17 " 15 "	6.53 "	5 "	5 "	75 "	Electri	340.00	Electiv	375.00
8 "	20 " 18 "	7.82 "	5 "	5 "	75 "	Elapseub	375.00	Elapayd	415.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

# GOULDS PUMP CYLINDERS OR WORKING BARRELS.

EVERYONE knows that the Cylinder is the Pump by means of which water is moved. If the Cylinder is defective, the Standard is of no use, no matter how attractive may be its appearance. Greatest care should be taken that all joints and connections are made tight.

Our Cast-iron and Cast-brass Cylinders are accurately bored, reamed and polished.

Brass Tube Cylinders are made of Seamless Drawn Brass Tubing with Iron or Brass Attachments.

Brass Lined Cylinders are Iron Cylinders lined with Seamless Drawn Brass Tubing.

Our technical names of different parts comprising a Working Cylinder are:

Body or Shell,

Plunger complete,

Plunger Cage,

Plunger Follower,

Plunger Poppet Valve,

Plunger Leather Packing,

Plunger Rod in E, G and H,

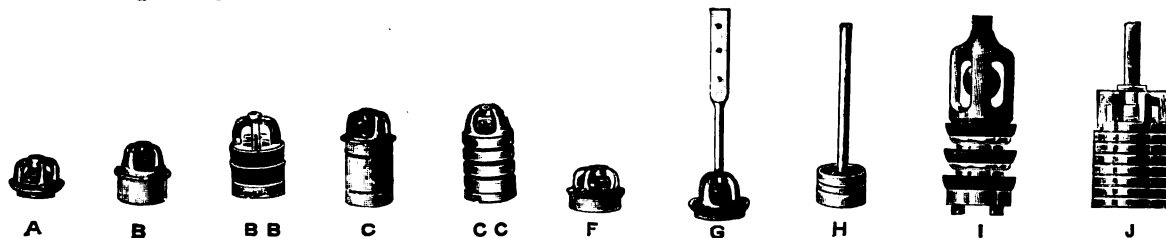
Top Attachment or Cap,

Bottom Attachment or Cap,

Lower Valve Leather,

Ring Packing for Top Attachment.

We can fit any of our Cylinders with Metallic Valves throughout, for pumping hot or corrosive liquids, at extra cost. The following are representations of our several types of Plungers and Pistons.



"A" Gas Set Plunger has cage with short follower, poppet valve and leather packing; used in Figs. 609 and 610, pages 82 and 84, and Fig. 559½, page 83.

"B" Shallow Well Plunger has cage with short turned and grooved follower, poppet valve and leather packing; used in Figs. 611 and 612, pages 82 and 84, and Fig. 616, pages 85 and 86.

"BB" Shallow Well Brass Plunger has cage with short turned follower, poppet valve and double crimped leather packings; used in Figs. 616 and 616½.

"C" Deep Well Plunger has cage with turned and grooved follower about 5 inches long, poppet valve and leather packing; used in Figs. 613, 614, 615, 616, pages 82 to 86, and Fig. 548, page 83.

"CC" Deep Well Brass Plunger has cage with turned follower, poppet valve and triple crimped leather packings; used in Figs. 616 and 616½.

"F" Shallow Well Plunger has all brass cage with short turned follower, poppet valve and leather packing; used in Fig. 616, 10 and 12 inches long, pages 85 and 86.

"G" Shallow Well Plunger, same as "A" style except that end of rod is flattened for attaching wood rod; used in Fig. 620, page 83.

"H" Piston has solid centre with double crimped leather packings on either side; used in Fig. 621, page 83.

"I" Brass Artesian Plunger has special pattern brass cage with follower and crimped packings and brass ball valve; used in Fig. 604, pages 88 and 89.

"J" Deep Well Plunger has brass cage with long turned and grooved follower, poppet valve and leather packing; used in Fig. 624, page 87.

For open wells, Figs. 609, 610, 611, 613, 616, 559½, 548, 621, 620 may be employed. For bored or drilled wells lined with casing, Figs. 612, 614, 615, 616½ or 617 should be used.

# METALLIC LOWER CYLINDER VALVES.

For Inside Attachment  
Cylinders.

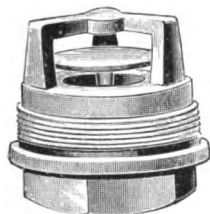


FIG. 79.

Figs. 79 and 80 represent our Brass Lower Valves as used in Iron, Brass Lined and Brass Tube Pump Cylinders. Fig. 79 is used with Figs. 612, 614, 619, 624 and 616½. Fig. 80 is used with Figs. 609, 611, 613, 616, 559½ and 548.

FIG. 79. SIZES AND PRICES.

Sizes in Inches (Diameter of Cylinder) . .	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	6	8
Price, Cage and Valve . . . . .	.75	.75	.75	.75	.75	.75	\$1.00	\$1.00	\$1.00	\$1.25	\$1.25	\$1.50	\$1.50	\$2.00	\$2.75
Price, Complete with Brass Attachment . .	\$2.75	\$2.75	\$2.75	\$2.75	\$2.75	\$2.75	\$3.00	\$3.50	\$3.50	\$3.75	\$5.00	\$6.00	\$6.00	\$7.25	\$10.00

For Outside Attachment  
Cylinders.



FIG. 80.

FIG. 80. SIZES AND PRICES.

Size, Inches (Diameter of Cylinders) . . . . .	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	6	8
Price, Complete . . . . .	.75	.75	.75	.75	\$1.00	\$1.00	\$1.00	\$1.25	\$1.25	\$1.50	\$1.50	\$2.00	\$2.75

## VALVE AND PLUNGER LEATHERS, ETC.

MADE OF PURE OAK-TANNED STOCK.

Plunger Leather — Crimped.

Ring Packing — for Cylinders.

Plunger Leather — not Crimped.

Lower Valve Leather.



SIZES AND PRICES.

Size, Inches (Diameter of Cylinders) . . . . .	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	6	8
Ring Packings, for Cylinders, each . . . . .	.10	.10	.10	.10	.10	.10	.10	.15	.15	.15	.15	.20	.25	.30	\$0.40
Plunger Leathers, not Crimped, each . . . . .	.15	.15	.15	.15	.15	.15	.15	.20	.20	.20	.20	.25	.30	.35	.50
Lower Valve Leathers, each . . . . .	.15	.15	.15	.15	.15	.15	.15	.20	.20	.20	.20	.25	.30	.35	.50
Plunger Leathers, Crimped, each . . . . .	.15	.15	.15	.15	.15	.20	.25	.30	.35	.40	.45	.55	.60	.75	1.25

TABLE SHOWING OUTSIDE DIAMETER OF CYLINDERS.

Inside Diameter, Inches . . . . .	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	6	8
OUTSIDE DIAMETER:															
Figs. 609, 611, 613 . . . . .	1¾	2	3½	3¾	3½	4¼	4¾	4¾	5	5½	5½	6¼	6¾	7¾	10
Figs. 612, 614, 615 . . . . .			2¾	2¾	3½	3¾	3¾	3¾	4¼	4¾	4¾	5½	5¾	6¾	8¾
Figs. 619, 624, 616½ . . . . .			2¾	2¾	2¾	3	3¼	3¼	3¾	4	4¾	5½	5¾	6¾	8¾
Fig. 616 . . . . .			2¾	3¼	3¼	3¾	3¾	4¼	4¾	4¾	5	5¾	6¾	7¾	

# GOULDS PUMP CYLINDERS OR WORKING BARRELS.

FIGS. 609, 610. GAS SET PUMP CYLINDERS. "A" PLUNGERS.

Screw  
Attach.



FIG. 609.

Outside  
Attach.



FIG. 611.

Outside  
Attach.



FIG. 613.

Bolt Attach.



FIG. 610.

Inside  
Attach.



FIG. 612.

Inside  
Attach.



FIG. 614.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	FIG. 609. IRON.		FIG. 610. IRON.	
							Cipher.	Price.	Cipher.	Price.
1	2 1/2 X 10 in.	6 in.	.10 gal.	1 in. pipe.	3/4 in.	50 ft.	Move	\$4.00	Murky	\$4.00
2	2 1/2 X 10 "	6 "	.13 "	1 1/4 "	1 "	50 "	Much	4.35	Muse	4.35
3	2 1/2 X 10 "	6 "	.15 "	1 3/4 "	1 1/2 "	50 "	Muckle	4.70	Muskat	4.70
4	3 X 10 "	6 "	.18 "	1 3/4 "	2 "	40 "	Muff	5.00	Mussme	5.00
6	3 1/2 X 10 "	6 "	.25 "	1 1/2 "	7-16 "	40 "	Mully	5.60	Mute	5.60
8	4 X 10 "	6 "	.32 "	2 "	1/2 "	40 "	Mumps	6.50	Nape	6.50

† FIGS. 611, 612. SHALLOW WELL PUMP CYLINDERS. "B" PLUNGERS.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	Fig. 611.		Fig. 612.	
							Cipher.	Price.	Cipher.	Price.
0	2 X 12 in.	8 in.	.11 gal.	1 in. pipe.	3/4 in.	75 ft.	Nonvid	\$5.50	Nonvox	\$5.50
1	2 1/4 X 12 "	8 "	.13 "	1 "	1 "	75 "	Navy	5.75	New	5.75
2	2 1/2 X 12 "	8 "	.17 "	1 1/4 "	7-16 "	75 "	Neal	6.00	Nexkeb	6.00
3	2 3/4 X 12 "	8 "	.20 "	1 1/2 "	7-16 "	75 "	Neapat	6.50	Niceby	6.50
4	3 X 12 "	8 "	.25 "	1 3/4 "	7-16 "	50 "	Nearo	7.00	Nich	7.00
5	3 1/4 X 12 "	8 "	.29 "	1 3/4 "	7-16 "	50 "	Neatam	7.50	Nickum	7.50
6	3 1/2 X 12 "	8 "	.33 "	1 1/2 "	7-16 "	50 "	Neckla	8.00	Ninesir	8.00
7	3 3/4 X 12 "	8 "	.38 "	1 1/2 "	7-16 "	50 "	Needab	8.50	Nodela	8.50
8	4 X 12 "	8 "	.43 "	2 "	1 1/2 "	50 "	Nestal	9.25	Noneat	9.25
10	4 1/2 X 12 "	8 "	.55 "	2 "	1 1/2 "	50 "	Nonslug	11.50	Listjac	11.50
12	5 X 12 "	8 "	.68 "	2 1/2 "	1 1/2 "	40 "	Nonsma	15.50	Listjel	15.50
16	6 X 12 "	18 "	.98 "	3 "	1 1/2 "	40 "	Nonsmig	18.00	Listjit	18.00
0	2 X 14 "	10 "	.14 "	1 "	3/4 in.	75 "	Numca	6.00	Numdi	6.00
1	2 1/4 X 14 "	10 "	.17 "	1 "	1 "	75 "	Nonsnid	6.25	Listkaa	6.25
2	2 1/2 X 14 "	10 "	.21 "	1 1/4 "	7-16 "	75 "	Nonsnot	6.50	Listked	6.50
3	2 3/4 X 14 "	10 "	.25 "	1 1/2 "	7-16 "	75 "	Nonsnuc	7.00	Listkis	7.00
4	3 X 14 "	10 "	.30 "	1 3/4 "	7-16 "	50 "	Nontab	7.50	Listkol	7.50
6	3 1/2 X 14 "	10 "	.41 "	1 3/4 "	7-16 "	50 "	Nontejo	8.50	Listkyb	8.50
8	4 X 14 "	10 "	.54 "	2 "	1 1/2 "	50 "	Nontism	11.00	Listleg	11.00
10	4 1/2 X 14 "	10 "	.69 "	2 "	1 1/2 "	50 "	Nonuth	15.00	Listliq	15.00
12	5 X 14 "	10 "	.85 "	2 1/2 "	1 1/2 "	40 "	Nonuw	20.00	Listlob	20.00
16	6 X 14 "	10 "	1.22 "	3 "	1 1/2 "	40 "	Nonuxas	25.00	Listlum	25.00

† FIGS. 613, 614. DEEP WELL PUMP CYLINDERS. "C" PLUNGERS.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	Fig. 613.		Fig. 614.	
							Cipher.	Price.	Cipher.	Price.
0	2 X 16 in.	10 in.	.14 gal.	1 in. pipe.	7-16 in.	200 ft.	Noonal	\$6.00	Oddsir	\$6.00
1	2 1/4 X 16 "	10 "	.17 "	1 "	7-16 "	200 "	Noseblu	6.50	Odor	6.50
2	2 1/2 X 16 "	10 "	.21 "	1 1/4 "	7-16 "	150 "	Notel	7.00	Ogee	7.00
3	2 3/4 X 16 "	10 "	.25 "	1 1/2 "	7-16 "	150 "	Nowd	7.50	Ogle	7.50
4	3 X 16 "	10 "	.30 "	1 3/4 "	7-16 "	100 "	Nude	8.00	Ogreat	8.00
6	3 1/2 X 16 "	10 "	.41 "	1 3/4 "	7-16 "	100 "	Numb	9.00	Olio	9.00
8	4 X 16 "	10 "	.43 "	2 "	1 1/2 "	100 "	Obey	12.00	Omitac	12.00
10	4 1/2 X 16 "	8 "	.55 "	2 "	1 1/2 "	100 "	Obeyed	16.00	Onceen	16.00
12	5 X 16 "	8 "	.68 "	2 1/2 "	1 1/2 "	100 "	Vile	23.00	Vilely	23.00
12	5 X 16 "	10 "	.85 "	2 1/2 "	1 1/2 "	100 "	Obfirm	26.00	Onion	26.00
16	6 X 16 "	8 "	.97 "	3 "	1 1/2 "	100 "	Vileds	30.00	Vilenes	30.00
24	8 X 16 "	8 "	1.74 "	4 "	1 1/2 "	75 "	Vilkut	60.00	Vigudm	60.00

For list on Brass Body and all Brass Cylinders, see Figs. 616 and 616 1/2, pages 85 and 86.

† Stroke for Outside Attachment Cylinders; Inside Attachment Cylinders, give 1 inch less.

\* Depth of wells in which Cylinders may be operated, or total lift and force from surface of water to point of discharge.



FIG. 615 1/2.

# GOULDS PUMP CYLINDERS OR WORKING BARRELS.

FIG. 615 1/2. DEEP WELL PUMP CYLINDER. "C" PLUNGER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	Lift and Force.	IRON.	
							Cipher.	Price.
1	2 1/4 X 20 in.	12 in.	.21 gal.	1 1/4 in. pipe.	7-16 in.	200 ft.	Elapta	\$8.00
2	2 1/2 X 20 "	12 "	.26 "	1 1/2 "	7-16 "	150 "	Elapteb	8.50
3	2 3/4 X 20 "	12 "	.31 "	1 3/4 "	7-16 "	150 "	Elaptis	9.00
4	3 X 20 "	12 "	.37 "	1 3/4 "	7-16 "	100 "	Elaptog	9.50
5	3 1/2 X 20 "	12 "	.50 "	1 1/2 "	7-16 "	100 "	Elaptud	10.75
8	4 X 20 "	12 "	.65 "	2 "	7-16 "	100 "	Elaptyc	14.00
10	4 1/2 X 20 "	12 "	.83 "	2 "	7-16 "	100 "	Elbaba	17.00
12	5 X 20 "	12 "	1.02 "	2 1/2 "	7-16 "	100 "	Elbacka	25.00
16	6 X 20 "	12 "	1.47 "	3 "	7-16 "	75 "	Elbady	45.00
24	8 X 20 "	12 "	2.61 "	4 "	7-16 "	75 "	Elbaf	90.00

FIG. 559 1/2. DEEP WELL PUMP CYLINDER. "A" PLUNGER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	Lift and Force.	IRON.	
							Cipher.	Price.
4	3 X 12 in.	8 in.	.24 gal.	1 1/4 in. pipe.	7-16 in.	50 ft.	Lawn	\$9.00
8	4 X 12 "	8 "	.43 "	2 "	7-16 "	50 "	Laxd	11.50

FIG. 548. DEEP WELL PUMP CYLINDER. "C" PLUNGER.

3	2 1/4 X 16 in.	9 in.	.23 gal.	1 1/4 in. pipe.	7-16 in.	150 ft.	Laper	\$11.00
4	3 X 16 "	9 "	.27 "	1 1/2 "	7-16 "	100 "	Larde	11.50
6	3 1/2 X 16 "	9 "	.37 "	1 1/2 "	7-16 "	100 "	Lash	12.50
8	4 X 16 "	9 "	.49 "	2 "	7-16 "	100 "	Late	14.00

FIG. 620. WOOD PUMP CYLINDER. "G" PLUNGER.

4	3 X 11 1/2 in.	9 in.	.27 gal.	1 1/4 in. pipe.	1/2 in.	40 ft.	Quay	\$3.00
5	3 1/4 X 11 1/2 "	9 "	.32 "	1 1/2 "	1/2 "	40 "	Quell	4.00
7	3 1/2 X 11 1/2 "	9 "	.43 "	1 1/2 "	1/2 "	40 "	Query	4.50

FIG. 621. DOUBLE-ACTING PUMP CYLINDER. "H" PISTON.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	IRON.		BRASS LINED.	
						Cipher.	Price.	Cipher.	Price.
1	2 1/4 X 10 1/2 in.	6 in.	.10 gal.	1 1/4 in. pipe.	3/4 in.	Quibe	\$10.00	Doteam	\$12.50
4	3 X 10 1/2 "	6 "	.18 "	1 1/2 "	3/4 "	Quick	12.00	Doteto	14.75
8	4 X 10 1/2 "	6 "	.32 "	2 "	3/4 "	Quid	14.00	Doteux	17.50
8	4 X 14 "	10 "	.54 "	2 "	3/4 "	Quiet	20.00	Dotfab	25.00

FIG. 559 1/2.



FIG. 620.



FIG. 548.

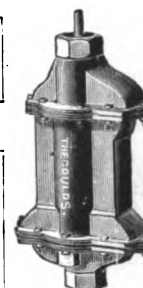


FIG. 621.

# GOULDS BRASS-LINED IRON CYLINDERS.

FIG. 609. GAS SET PUMP CYLINDER. "A" PLUNGER.



No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	Brass Cage and Valve Plunger.		All Brass Plunger.	
							Cipher.	Price.	Cipher.	Price.
1	2 1/4 x 10 in.	6 in.	.10 gal.	1 in. pipe.	3/8 in.	50 ft.	Curbik	\$7.50	Crouter	\$8.00
2	2 1/2 x 10 "	6 "	.13 "	1 1/4 "	7-16 "	50 "	Curbjo	7.75	Curcome	8.25
3	2 3/4 x 10 "	6 "	.15 "	1 1/2 "	7-16 "	50 "	Curbky	8.25	Curcus	8.75
4	3 x 10 "	6 "	.18 "	1 3/4 "	7-16 "	40 "	Curbla	8.75	Curcyx	9.25
6	3 1/2 x 10 "	6 "	.25 "	1 1/2 "	7-16 "	40 "	Curcab	10.25	Curjess	10.75
8	4 x 10 "	6 "	.32 "	2 "	7/8 "	40 "	Curcof	11.00	Curkud	12.00

FIG. 609.

Outside Attach.



FIG. 611. SHALLOW WELL PUMP CYLINDER. "B" PLUNGER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	Brass Cage and Valve Plunger.		All Brass Plunger.	
							Cipher.	Price.	Cipher.	Price.
0	2 x 12 in.	8 in.	.11 gal.	1 in. pipe.	3/8 in.	75 ft.	Tubest	\$7.50	Twanger	\$8.75
1	2 1/4 x 12 "	8 "	.13 "	1 "	3/8 "	75 "	Trump	8.00	Twangle	9.25
2	2 1/2 x 12 "	8 "	.17 "	1 1/4 "	7-16 "	75 "	Trunk	8.50	Twank	9.75
3	2 3/4 x 12 "	8 "	.20 "	1 1/2 "	7-16 "	75 "	Trussa	9.00	Twattle	10.50
4	3 x 12 "	8 "	.25 "	1 3/4 "	7-16 "	50 "	Trust	9.50	Tway	11.00
6	3 1/2 x 12 "	8 "	.33 "	1 1/2 "	7-16 "	50 "	Tryat	10.50	Tweedle	13.00
8	4 x 12 "	8 "	.43 "	2 "	7/8 "	50 "	Tuber	12.50	Tweeze	15.75
10	4 1/2 x 12 "	8 "	.55 "	2 "	7/8 "	50 "	Daylyx	14.50	Decgor	18.50
12	5 x 12 "	8 "	.68 "	2 1/4 "	7/8 "	40 "	Daymat	20.00	Decgum	25.00
16	6 x 12 "	8 "	.98 "	3 "	7/8 "	40 "	Daymel	24.00	Decgyo	31.00
0	2 x 14 "	10 "	.14 "	1 "	3/8 "	75 "	Dotgal	8.25	Canjab	9.50
1	2 1/4 x 14 "	10 "	.17 "	1 "	3/8 "	75 "	Dechill	8.75	Caqqle	10.00
2	2 1/2 x 14 "	10 "	.21 "	1 1/4 "	7-16 "	75 "	Dibyom	9.25	Carab	10.50
3	2 3/4 x 14 "	10 "	.25 "	1 1/2 "	7-16 "	75 "	Dibyut	9.75	Carbun	11.25
4	3 x 14 "	10 "	.30 "	1 3/4 "	7-16 "	50 "	Dibyusa	10.25	Butram	11.75
6	3 1/2 x 14 "	10 "	.41 "	1 1/2 "	7-16 "	50 "	Dirhac	11.25	Dawadd	13.75
8	4 x 14 "	10 "	.54 "	2 "	7/8 "	50 "	Ditdac	14.00	Dawbets	17.25
10	4 1/2 x 14 "	10 "	.69 "	2 "	7/8 "	50 "	Ditdim	18.00	Dheuate	22.00
12	5 x 14 "	10 "	.85 "	2 1/2 "	7/8 "	40 "	Ditdub	24.50	Dheubeb	29.50
16	6 x 14 "	10 "	1.22 "	3 "	7/8 "	40 "	Ditdys	31.00	Dheubum	38.00

FIG. 611.

Outside Attach.



FIG. 613. DEEP WELL PUMP CYLINDER. "C" PLUNGER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	Brass Cage and Valve Plunger.		All Brass Plunger.	
							Cipher.	Price.	Cipher.	Price.
0	2 x 16 in.	10 in.	.14 gal.	1 in. pipe.	7-16 in.	200 ft.	Twang	\$9.00	Twink	\$10.50
1	2 1/4 x 16 "	10 "	.17 "	1 1/4 "	7-16 "	200 "	Twig	9.50	Twinkle	11.00
2	2 1/2 x 16 "	10 "	.21 "	1 1/2 "	7-16 "	150 "	Twiggen	10.00	Twinkl	11.50
3	2 3/4 x 16 "	10 "	.25 "	1 3/4 "	7-16 "	150 "	Twiggy	10.50	Twinter	12.00
4	3 x 16 "	10 "	.30 "	1 1/2 "	7-16 "	100 "	Twill	11.00	Twire	12.75
6	3 1/2 x 16 "	10 "	.41 "	1 1/2 "	7-16 "	100 "	Twined	12.00	Twist	14.50
8	4 x 16 "	8 "	.43 "	2 "	7/8 "	100 "	Twining	15.75	Twisting	19.00
10	4 1/2 x 16 "	8 "	.55 "	2 "	7/8 "	75 "	Dodgus	20.00	Dodhug	24.00
12	5 x 16 "	8 "	.68 "	2 1/2 "	7/8 "	75 "	Dodgtul	27.50	Dodics	32.50
16	6 x 16 "	8 "	.98 "	3 "	7/8 "	75 "	Dodham	35.00	Dodide	42.00
24	8 x 16 "	8 "	1.74 "	4 "	7/8 "	75 "	Dodhole	70.00	Dodifo	84.00

FIG. 613.

\* Depth of wells in which Cylinders may be operated, or total lift and force from water to point of discharge.

# SEAMLESS BRASS TUBE PUMP CYLINDERS.

Outside  
Attach.



FIG. 616.

Outside  
Attach.



FIG. 616.

Outside  
Attach.



FIG. 616.

10½ INCHES LONG. "F" PLUNGER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	BRASS BODY & PLUNGER.		ALL BRASS.	
							Cipher.	Price.	Cipher.	Price.
0	2 X 10½ in.	7 in.	.10 gal.	1 in. pipe.	¾ in.	50 ft.	Tortwx	\$7.50	Edhabe	\$10.75
1	2½ X 10½ "	7 "	.12 "	1 "	7-16 "	50 "	Touchy	7.75	Vincible	11.00
2	2½ X 10½ "	7 "	.15 "	1½ "	7-16 "	50 "	Toughen	8.00	Vindica	12.25
3	2½ X 10½ "	7 "	.18 "	1½ "	7-16 "	50 "	Tourist	8.50	Vine	12.75
4	3 X 10½ "	7 "	.21 "	1½ "	7-16 "	40 "	Tourney	9.00	Vined	13.50
6	3½ X 10½ "	7 "	.29 "	1½ "	7-16 "	40 "	Townlfa	10.50	Edkac	16.75
8	4 X 10½ "	7 "	.38 "	2 "	½ "	40 "	Edhaas	14.00	Edkael	21.50

Inside  
Attach.



FIG.  
616½.

Inside  
Attach.



FIG.  
616½.

Inside  
Attach.



FIG.  
616½.

12 INCHES LONG. "F" PLUNGER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	BRASS BODY & PLUNGER.		ALL BRASS.	
							Cipher.	Price.	Cipher.	Price.
0	2 X 12 in.	9 in.	.12 gal.	1 in. pipe.	¾ in.	75 ft.	Curvin	\$8.00	Dabcik	\$11.25
1	2½ X 12 "	9 "	.15 "	1 "	7-16 "	75 "	Tough	8.25	Vinegar	11.50
2	2½ X 12 "	9 "	.19 "	1½ "	7-16 "	75 "	Toura	8.50	Vinegru	12.75
3	2½ X 12 "	9 "	.23 "	1½ "	7-16 "	75 "	Tourn	9.00	Viner	13.25
4	3 X 12 "	9 "	.27 "	1½ "	7-16 "	50 "	Touse	9.50	Vinery	14.00
6	3½ X 12 "	9 "	.37 "	1½ "	7-16 "	50 "	Toward	11.25	Vinyard	17.50
8	4 X 12 "	9 "	.49 "	2 "	¾ "	50 "	Townar	15.00	Vinous	22.50
10	4½ X 12 "	9 "	.62 "	2 "	¾ "	50 "	Curyib	25.00	Dabit	34.00
12	5 X 12 "	9 "	.77 "	2½ "	¾ "	40 "	Curyjo	34.00	Dabjox	46.00
16	6 X 12 "	9 "	1.10 "	3 "	¾ "	40 "	Curyki	50.00	Dabkook	64.00

14 INCHES LONG. "B" PLUNGER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	BRASS BODY & PLUNGER.		ALL BRASS.	
							Cipher.	Price.	Cipher.	Price.
0	2 X 14 in.	10 in.	.13 gal.	1 in. pipe.	¾ in.	75 ft.	DaygwX	\$9.75	Decazy	\$13.00
1	2½ X 14 "	10 "	.17 "	1 "	7-16 "	75 "	Dayhab	10.25	Decceb	13.50
2	2½ X 14 "	10 "	.21 "	1½ "	7-16 "	75 "	Dayhelm	10.50	Deceebe	14.75
3	2½ X 14 "	10 "	.25 "	1½ "	7-16 "	75 "	Dayhog	11.25	Decept	15.50
4	3 X 14 "	10 "	.30 "	1½ "	7-16 "	50 "	Dayhum	11.75	Decerto	16.25
6	3½ X 14 "	10 "	.41 "	1½ "	7-16 "	50 "	Daykaby	14.75	Decetmx	21.00
8	4 X 14 "	10 "	.54 "	2 "	¾ "	50 "	Daykiss	19.00	Decfidy	26.50
10	4½ X 14 "	10 "	.69 "	2 "	¾ "	50 "	Daykow	28.00	Decfox	36.00
12	5 X 14 "	10 "	.85 "	2½ "	¾ "	40 "	Daylap	38.00	Decfoyr	50.00
16	6 X 14 "	10 "	1.22 "	3 "	¾ "	40 "	Dayleep	56.00	Decgam	70.00

We can furnish with "B B" and "C C" Plungers to order.

The above Cipher words apply to Fig. 616; when Fig. 616½ is wanted, add the word "Inside" to the Cipher word.

† Stroke for outside Attachment Cylinders; inside Attachment Cylinders give 1 inch less.

\* Total lift and force from supply to point of delivery.

# SEAMLESS BRASS TUBE PUMP CYLINDERS.

16 INCHES LONG. "C" PLUNGER.



FIG. 616.



FIG. 616



FIG. 616.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	BRASS BODY AND PLUNGER.		ALL BRASS.	
							Cipher.	Price.	Cipher.	Price.
000	1 1/2 x 16 in.	9 in.	.07 gal.	1 in. pipe.	1/2 in.	200 ft.	Diabe	\$10.50	Fieldux	\$13.75
00	1 1/4 x 16 "	9 "	.09 "	1 1/4 "	7-16 "	200 "	Diabik	10.50	Fieldyl	13.75
0	2 x 16 "	9 "	.12 "	1 1/4 "	7-16 "	200 "	Diabjac	10.50	Fielema	13.75
1	2 1/4 x 16 "	9 "	.15 "	1 1/4 "	7-16 "	200 "	Diabjel	11.25	Fielend	14.50
2	2 1/2 x 16 "	9 "	.19 "	1 1/4 "	7-16 "	150 "	Diabkab	11.75	Fieleta	16.00
3	2 3/4 x 16 "	9 "	.23 "	1 1/4 "	7-16 "	150 "	Diabkum	12.25	Fielfaa	16.50
4	3 x 16 "	9 "	.27 "	1 1/4 "	7-16 "	100 "	Diabvol	12.75	Fielfin	17.25
6	3 1/2 x 16 "	9 "	.37 "	1 1/2 "	7-16 "	100 "	Diabwub	16.00	Fielgac	22.25
8	4 x 16 "	9 "	.49 "	2 "	1/2 "	100 "	Dibba	20.50	Fielgoz	28.00
10	4 1/2 x 16 "	9 "	.62 "	2 "	1/2 "	100 "	Dibber	30.50	Fielgua	38.75
12	5 x 16 "	9 "	.76 "	2 1/2 "	1/2 "	100 "	Dibbol	42.00	Fielgwi	53.50
16	6 x 16 "	9 "	1.10 "	3 "	1/2 "	100 "	Dibbum	62.00	Fiemab	75.00
24	8 x 16 "	9 "	1.96 "	4 "	3/4 "	75 "	Dibtab	124.00	Fiemace	150.00



FIG. 616 1/2.



FIG. 616 1/2.



FIG. 616 1/2.

18 INCHES LONG. "C" PLUNGER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	BRASS BODY AND PLUNGER.		ALL BRASS.	
							Cipher.	Price.	Cipher.	Price.
000	1 1/2 x 18 in.	10 in.	.08 gal.	1 in. pipe.	1/2 in.	200 ft.	Firfame	\$11.00	Firgul	\$14.25
00	1 1/4 x 18 "	10 "	.10 "	1 1/4 "	7-16 "	200 "	Firfanz	11.00	Flamod	14.25
0	2 x 18 "	10 "	.14 "	1 1/4 "	7-16 "	200 "	Firfape	11.00	Flamocf	14.25
1	2 1/4 x 18 "	10 "	.17 "	1 1/4 "	7-16 "	200 "	Firfaqu	12.00	Flamoga	15.25
2	2 1/2 x 18 "	10 "	.21 "	1 1/4 "	7-16 "	150 "	Firfebu	12.75	Flamub	17.00
3	2 3/4 x 18 "	10 "	.26 "	1 1/4 "	7-16 "	150 "	Firfecsa	13.25	Flamuck	17.50
4	3 x 18 "	10 "	.31 "	1 1/4 "	7-16 "	100 "	Firgac	13.75	Flamuda	18.25
6	3 1/2 x 18 "	10 "	.42 "	1 1/2 "	7-16 "	100 "	Firgib	17.25	Flamugl	23.50
8	4 x 18 "	10 "	.54 "	2 "	1/2 "	100 "	Firgics	22.25	Flamwa	29.75
10	4 1/2 x 18 "	10 "	.69 "	2 "	1/2 "	100 "	Firgidl	35.00	Flamweb	43.25
12	5 x 18 "	10 "	.85 "	2 1/2 "	1/2 "	100 "	Firgifo	47.00	Flamwit	58.50
16	6 x 18 "	10 "	1.22 "	3 "	1/2 "	100 "	Firgols	67.00	Flamwoc	80.00
24	8 x 18 "	10 "	2.18 "	4 "	3/4 "	75 "	Firgome	134.00	Flamwuk	160.00

20 INCHES LONG. "C" PLUNGER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	BRASS BODY AND PLUNGER.		ALL BRASS.	
							Cipher.	Price.	Cipher.	Price.
000	1 1/2 x 20 in.	12 in.	.09 gal.	1 in. pipe.	1/2 in.	200 ft.	Fluifa	\$11.50	Folipba	\$14.75
00	1 1/4 x 20 "	12 "	.12 "	1 1/4 "	7-16 "	200 "	Fluifid	11.50	Folist	14.75
0	2 x 20 "	12 "	.16 "	1 1/4 "	7-16 "	200 "	Fluifog	11.50	Folitu	14.75
1	2 1/4 x 20 "	12 "	.21 "	1 1/4 "	7-16 "	200 "	Fluifut	27.50	Foliud	16.00
2	2 1/2 x 20 "	12 "	.26 "	1 1/4 "	7-16 "	150 "	Flujab	13.50	Foliva	17.75
3	2 3/4 x 20 "	12 "	.31 "	1 1/4 "	7-16 "	150 "	Flujila	14.25	Foliwe	18.50
4	3 x 20 "	12 "	.37 "	1 1/4 "	7-16 "	100 "	Flujka	14.75	Folixal	19.25
6	3 1/2 x 20 "	12 "	.50 "	1 1/2 "	7-16 "	100 "	Flujkeg	18.00	Foljac	24.25
8	4 x 20 "	12 "	.65 "	2 "	1/2 "	100 "	Flujkod	24.00	Foljalc	31.50
10	4 1/2 x 20 "	12 "	.83 "	2 "	1/2 "	100 "	Flujlam	39.50	Foljamb	47.75
12	5 x 20 "	12 "	1.02 "	2 1/2 "	1/2 "	100 "	Flujlid	52.00	Foljans	63.50
16	6 x 20 "	12 "	1.47 "	3 "	1/2 "	100 "	Flujmad	72.00	Foljaoc	85.00
24	8 x 20 "	12 "	2.61 "	4 "	3/4 "	75 "	Flujnec	144.00	Foljapa	170.00

We can furnish with "C C" Plungers to order.

The above Cipher words apply to Fig. 616; when Fig. 616 1/2 is wanted add the word Inside to the Cipher word. \*Total lift and force from supply to point of delivery.

†Stroke for outside Attachment Cylinders; Inside Attachment Cylinders, give 1 inch less.



# GOULDS SEAMLESS BRASS TUBE PUMP CYLINDERS.

FIG. 619. SHALLOW WELL CYLINDER. "A" PLUNGER. BRASS CAGE AND VALVE.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	BRASS BODY.	
							Cipher.	Price.
2	2½ X 10½ in.	7 in.	.15 gal.	1¼ in. pipe.	¾ in.	50 ft.	Dancfee	\$8.00
4	3 X 10½ "	7 "	.21 "	1¼ "	¾ "	40 "	Dancgo	9.00
2	2½ X 12 "	9 "	.19 "	1½ "	¾ "	75 "	Danchem	8.50
4	3 X 12 "	9 "	.28 "	1½ "	¾ "	50 "	Dancija	9.50
2	2½ X 14 "	10 "	.21 "	1½ "	¾ "	75 "	Danckro	10.50
4	3 X 14 "	10 "	.31 "	1½ "	¾ "	50 "	Danckub	11.75
2	2½ X 16 "	12 "	.26 "	1½ "	¾ "	150 "	Danclam	11.75
4	3 X 16 "	12 "	.37 "	1½ "	¾ "	100 "	Dancmix	12.75

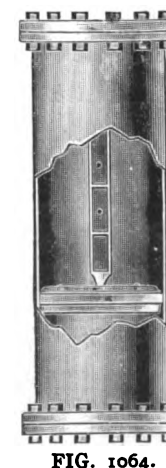
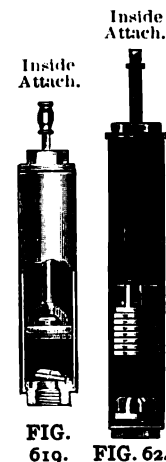
FIG. 624. DEEP WELL BRASS PUMP CYLINDER. "J" PLUNGER. METALLIC LOWER VALVE.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	ALL BRASS.	
							Cipher.	Price.
0	2 X 16 in.	8 in.	.11 gal.	1 in. pipe.	¾ in.	200 ft.	Frealab	\$13.00
2	2½ X 16 "	8 "	.17 "	1¼ "	7-16 "	150 "	Frealic	14.50
4	3 X 16 "	8 "	.24 "	1½ "	7-16 "	100 "	Frealot	16.50
6	3½ X 16 "	8 "	.33 "	1½ "	7-16 "	100 "	Frealud	20.00
8	4 X 16 "	8 "	.44 "	2 "	7-16 "	100 "	Frealwo	26.00
10	4½ X 16 "	8 "	.55 "	2 "	7-16 "	100 "	Frealyu	33.00
12	5 X 16 "	8 "	.68 "	2½ "	7-16 "	100 "	Freama	40.00
16	6 X 16 "	8 "	.98 "	3 "	7-16 "	75 "	Freamil	56.00
0	2 X 20 "	10 "	.14 "	1 "	7-16 "	200 "	Freamuk	16.00
2	2½ X 20 "	10 "	.21 "	1¼ "	7-16 "	150 "	Frebab	17.50
4	3 X 20 "	10 "	.31 "	1½ "	7-16 "	100 "	Frebac	20.00
6	3½ X 20 "	10 "	.42 "	1½ "	7-16 "	100 "	Frebils	24.00
8	4 X 20 "	10 "	.54 "	2 "	7-16 "	100 "	Frebimo	31.00
10	4½ X 20 "	10 "	.69 "	2 "	7-16 "	100 "	Frebobs	40.00
12	5 X 20 "	10 "	.85 "	2½ "	7-16 "	100 "	Frebock	50.00
16	6 X 20 "	10 "	1.22 "	3 "	7-16 "	75 "	Frebuby	65.00
4	3 X 30 "	16 "	.49 "	1½ "	7-16 "	100 "	Freburs	50.00
6	3½ X 30 "	16 "	.67 "	2 "	7-16 "	100 "	Frebson	55.00
8	4 X 30 "	16 "	.87 "	2 "	7-16 "	100 "	Frebsul	60.00
10	4½ X 30 "	16 "	1.02 "	2½ "	7-16 "	100 "	Frecac	67.50
12	5 X 30 "	16 "	1.36 "	3 "	7-16 "	100 "	Frecade	75.00
16	6 X 30 "	16 "	1.96 "	3½ "	7-16 "	100 "	Frecils	90.00
24	8 X 30 "	16 "	3.48 "	4 "	7-16 "	75 "	Frecimo	175.00

FIG. 1064. IRON IRRIGATION PUMP CYLINDER.

No.	Size.	Stroke.	Capacity per Stroke.	Fitted for	Well Rod.	* Lift and Force.	IRON.	
							Cipher.	Price.
16	6 X 18 in.	15 in.	1.84 gal.	Wrought-iron	Wood rod,	100 ft.	Dotfodi	\$15.00
24	8 X 18 "	15 "	3.26 "	or riveted	as ordered.	75 "	Dotfum	25.00
32	10 X 18 "	15 "	5.10 "	pipe, as ordered.		50 "	Dotfurl	35.00
40	12 X 18 "	15 "	7.35 "			50 "	Dotfust	65.00

\* Depth of wells in which Cylinders may be operated, or total lift and force from surface of water.





## GOULDS BRASS ARTESIAN DEEP WELL PUMP.

**Fig. 904**, Brass Deep Well Pump, is intended for use with our Differential Working Heads, illustrated and described on pages 68 to 75 inclusive. The working barrel or cylinder is seamless drawn brass tubing with cast brass top and bottom attachments, which are threaded for standard wrought-iron pipe connections. (The 3-inch size is intended for connecting with casing and threaded accordingly.) At the bottom a suction pipe and strainer may be attached. The plunger and lower valves are bronze balls. The plunger has cup leather packings. It will be made with water grooves or metallic packed, if so ordered. The plunger and lower valve can be inserted or removed through the connecting pipe, which is larger diameter than the bore of cylinder. Wood sucker rods with forged couplings (see page 90) are recommended, connecting the plunger and sucker rods by means of the valve rod (see page 90). The valve stems, valve rod, sucker rod couplings and lower end of differential plunger are all made with standard wrought-iron pipe threads.

The price includes the **Fig. 904** Deep Well Pump complete. For prices of valve rods, sucker rods and couplings, see page 90.

**FIG. 904.**

**FIG. 904. SIZES, CAPACITIES, ETC.**

Dia.	Stroke.	Capacity per Stroke.	Proper Speed and Capacity per Min.	DIMENSIONS.		Inside Diameter Well Casing.	Top and Bottom Connecting Pipes.	Square Wood Sucker Rod.	Cipher.	Price.
				Length Pump Chamber.	Maximum Outside Diameter.					
1 3/8 in.	16 in.	.10 gal.	40 str. — 4. gals.	32 in.	2 13-16 in.	3 1/4 in.	1 1/2 in.	1 in.	Wheya	\$15.00
1 3/8 "	16 "	.16 "	40 " — 6.4 "	32 "	2 15-16 "	3 1/4 "	2 "	1 "	Whiff	18.00
1 3/8 "	24 "	.25 "	40 " — 10.00 "	40 "	2 15-16 "	3 1/4 "	2 "	1 "	Woden	21.00
2 1/8 "	10 "	.172 "	40 " — 6.88 "	26 "	3 9-16 "	4 1/4 "	2 1/2 "	1 1/4 "	Dumpol	22.00
2 1/8 "	16 "	.275 "	40 " — 11.0 "	32 "	3 9-16 "	4 1/4 "	2 1/2 "	1 1/4 "	Whigy	26.00
2 1/8 "	24 "	.41 "	40 " — 16.4 "	40 "	3 9-16 "	4 1/4 "	2 1/2 "	1 1/4 "	Woodic	30.00
2 3/8 "	36 "	.61 "	40 " — 24.4 "	52 "	3 9-16 "	4 1/4 "	2 1/2 "	1 1/4 "	Dufear	34.00
2 3/8 "	10 "	.257 "	40 " — 10.28 "	26 "	3 7/8 "	4 1/2 "	3 "	1 1/2 "	Dumpuy	28.00
2 3/8 "	16 "	.411 "	40 " — 16.44 "	32 "	3 7/8 "	4 1/2 "	3 "	1 1/2 "	Whilom	32.00
2 3/8 "	24 "	.61 "	40 " — 24.40 "	40 "	3 7/8 "	4 1/2 "	3 "	1 1/2 "	Whimpe	37.00
2 3/8 "	30 "	.77 "	40 " — 30.80 "	46 "	3 7/8 "	4 1/2 "	3 "	1 1/2 "	Whird	42.00
3 "	16 "	.49 "	40 " — 19.60 "	32 "	4 11-16 "	5 3-16 "	3 1/4 "	1 3/4 "	Whilst	45.00
3 "	24 "	.73 "	40 " — 29.20 "	44 "	4 11-16 "	5 3-16 "	3 1/4 "	1 3/4 "	Woful	50.00
3 "	30 "	.92 "	40 " — 36.80 "	50 "	4 11-16 "	5 3-16 "	3 1/4 "	1 3/4 "	Wold	55.00

FIG. 904. SIZES, CAPACITIES, ETC. (Continued).

Dia.	Stroke.	Capacity per Stroke.	Proper Speed and Capacity per Min.	DIMENSIONS.		Inside Dia. Well Casing.	Top and Bottom Connect- ing Pipes.	Square Wood Sucker Rod.	Cipher.	Price.
				Length Pump Cham- ber.	Maxi- mum Outside Dia.					
3 1/2 in.	10 in.	.36 gals.	40 str. — 14.40 gals.	30 in.	4 7-16 in.	5 3-16 in.	3 1/2 in.	2 in.	Dumpyb	\$46.00
3 1/2 "	16 "	.574 "	40 " — 22.96 "	36 "	4 7-16 "	5 3-16 "	3 1/2 "	2 "	Whim	50.00
3 1/2 "	24 "	.802 "	40 " — 34.48 "	44 "	4 7-16 "	5 3-16 "	3 1/2 "	2 "	Whine	55.00
3 1/2 "	30 "	1.06 "	40 " — 42.40 "	50 "	4 7-16 "	5 3-16 "	3 1/2 "	2 "	Whirls	60.00
3 1/2 "	36 "	1.292 "	40 " — 51.68 "	56 "	4 7-16 "	5 3-16 "	3 1/2 "	2 "	Whoop	65.00
3 1/2 "	10 "	.478 "	40 " — 19.12 "	34 "	5 1/8 "	5 1/8 "	4 "	2 1/4 "	Dumqueel	65.00
3 1/2 "	16 "	.764 "	40 " — 30.56 "	40 "	5 1/8 "	5 1/8 "	4 "	2 1/4 "	Zylonkk	70.00
3 1/2 "	20 "	.95 "	40 " — 38.00 "	44 "	5 1/8 "	5 1/8 "	4 "	2 1/4 "	Duband	72.50
3 1/2 "	24 "	1.147 "	40 " — 45.88 "	48 "	5 1/8 "	5 1/8 "	4 "	2 1/4 "	Whiners	75.00
3 1/2 "	28 "	1.34 "	40 " — 53.60 "	52 "	5 1/8 "	5 1/8 "	4 "	2 1/4 "	Dubape	80.00
3 1/2 "	30 "	1.374 "	40 " — 54.96 "	54 "	5 1/8 "	5 1/8 "	4 "	2 1/4 "	Whisk	85.00
3 1/2 "	36 "	1.72 "	40 " — 68.80 "	60 "	5 1/8 "	5 1/8 "	4 "	2 1/4 "	Wick	95.00
3 1/2 "	42 "	2.0 "	40 " — 80.00 "	66 "	5 1/8 "	5 1/8 "	4 "	2 1/4 "	Wikecd	105.00
4 1/2 "	10 "	.614 "	40 " — 24.56 "	34 "	5 1/2 "	6 1/4 "	4 1/2 "	2 1/2 "	Dumqued	85.00
4 1/2 "	16 "	.982 "	40 " — 39.28 "	40 "	5 1/2 "	6 1/4 "	4 1/2 "	2 1/2 "	Zylonle	90.00
4 1/2 "	20 "	1.23 "	40 " — 49.20 "	44 "	5 1/2 "	6 1/4 "	4 1/2 "	2 1/2 "	Dubard	92.50
4 1/2 "	24 "	1.473 "	40 " — 58.92 "	48 "	5 1/2 "	6 1/4 "	4 1/2 "	2 1/2 "	Whinny	95.00
4 1/2 "	28 "	1.72 "	40 " — 68.80 "	52 "	5 1/2 "	6 1/4 "	4 1/2 "	2 1/2 "	Duelfan	97.50
4 1/2 "	30 "	1.842 "	40 " — 73.68 "	54 "	5 1/2 "	6 1/4 "	4 1/2 "	2 1/2 "	Whisto	100.00
4 1/2 "	36 "	2.21 "	40 " — 88.40 "	60 "	5 1/2 "	6 1/4 "	4 1/2 "	2 1/2 "	Widen	110.00
4 1/2 "	42 "	2.60 "	40 " — 104.00 "	66 "	5 1/2 "	6 1/4 "	4 1/2 "	2 1/2 "	Wiled	120.00
4 1/2 "	10 "	.767 "	40 " — 30.68 "	34 "	6 1/8 "	6 5/8 "	5 "	3 "	Dumquill	120.00
4 1/2 "	16 "	1.227 "	40 " — 49.08 "	40 "	6 1/8 "	6 5/8 "	5 "	3 "	Zylonm	125.00
4 1/2 "	20 "	1.53 "	40 " — 61.20 "	44 "	6 1/8 "	6 5/8 "	5 "	3 "	Duelfut	127.50
4 1/2 "	24 "	1.84 "	40 " — 73.60 "	48 "	6 1/8 "	6 5/8 "	5 "	3 "	Whippe	130.00
4 1/2 "	28 "	2.15 "	40 " — 86.00 "	52 "	6 1/8 "	6 5/8 "	5 "	3 "	Duelfyl	132.50
4 1/2 "	30 "	2.30 "	40 " — 92.00 "	54 "	6 1/8 "	6 5/8 "	5 "	3 "	Whita	135.00
4 1/2 "	36 "	2.76 "	40 " — 110.04 "	60 "	6 1/8 "	6 5/8 "	5 "	3 "	Wield	145.00
4 1/2 "	42 "	3.22 "	40 " — 128.80 "	66 "	6 1/8 "	6 5/8 "	5 "	3 "	Wilkta	155.00
5 1/2 "	10 "	1.12 "	40 " — 44.80 "	34 "	7 1/4 "	8 1/4 "	6 "	3 1/2 "	Dubame	155.00
5 1/2 "	16 "	1.798 "	40 " — 71.92 "	40 "	7 1/4 "	8 1/4 "	6 "	3 1/2 "	Zylonna	160.00
5 1/2 "	20 "	2.2 "	40 " — 88.00 "	44 "	7 1/4 "	8 1/4 "	6 "	3 1/2 "	Dufad	162.50
5 1/2 "	24 "	2.696 "	40 " — 107.84 "	48 "	7 1/4 "	8 1/4 "	6 "	3 1/2 "	Dufabl	165.00
5 1/2 "	28 "	3.1 "	40 " — 124.00 "	52 "	7 1/4 "	8 1/4 "	6 "	3 1/2 "	Dufact	170.00
5 1/2 "	30 "	3.36 "	40 " — 134.40 "	54 "	7 1/4 "	8 1/4 "	6 "	3 1/2 "	Whiz	175.00
5 1/2 "	36 "	4.04 "	40 " — 161.60 "	60 "	7 1/4 "	8 1/4 "	6 "	3 1/2 "	Wight	195.00
5 1/2 "	42 "	4.71 "	40 " — 188.40 "	66 "	7 1/4 "	8 1/4 "	6 "	3 1/2 "	Willow	215.00
7 1/2 "	16 "	3.26 "	40 " — 130.40 "	36 "	9 1/2 "	9 1/2 "	8 "	5 "	Zylonoc	350.00
7 1/2 "	20 "	4.0 "	40 " — 160.00 "	40 "	9 1/2 "	9 1/2 "	8 "	5 "	Dufale	375.00
7 1/2 "	24 "	4.90 "	40 " — 196.00 "	44 "	9 1/2 "	9 1/2 "	8 "	5 "	Willri	400.00
7 1/2 "	28 "	5.6 "	40 " — 224.00 "	48 "	9 1/2 "	9 1/2 "	8 "	5 "	Dufami	450.00
7 1/2 "	30 "	6.12 "	40 " — 244.80 "	50 "	9 1/2 "	9 1/2 "	8 "	5 "	Dubal	470.00
7 1/2 "	36 "	7.34 "	40 " — 293.60 "	56 "	9 1/2 "	9 1/2 "	8 "	5 "	Willga	540.00

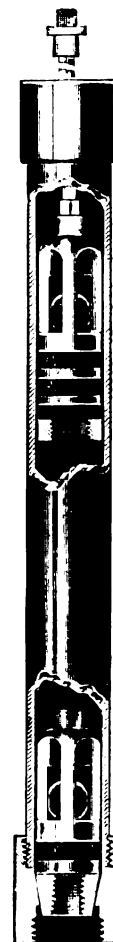


FIG. 904.

# GOULDS DEEP WELL CONNECTING PARTS.

## VALVE RODS, SUCKER RODS AND COUPLINGS.

**Fig. 76, Valve Rod,** is a forged wrought-iron piece used to connect the deep well plunger and the sucker rod. It is comparatively much less in cross-section than the wood sucker rod, and of a length sufficient to prevent the sucker rod from entering the top end of pump cylinder and thereby restricting the flow of water. There is a price list below. It includes all the sizes required by the deep well Pumps described on the preceding pages.

**Fig. 68, Sucker Rod Couplings,** are of forged wrought-iron, complete and ready to be attached to sucker rods. The price list includes all the sizes used with the deep well pumping apparatuses described on the preceding pages.

**Fig. 77, Wood Sucker Rods,** are made of the best white ash. The prices include all necessary couplings attached.

## SQUARE WOOD SUCKER RODS, COUPLINGS AND VALVE RODS.

### SIZES, PRICES, ETC.

Size Square Wood Sucker Rods.	Couplings, Valve Rods, etc., have Pipe Threads.	Inside Diameter of Deep Well Pump.	SUCKER ROD AND COUPLING, Fig. 77.		COUPLING, Fig. 68.		VALVE ROD, Fig. 76.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1 1/4 in.	1/2 in.	2 1/4 in.	Easkoty	\$0.10 per ft.	Easimel	\$1.25 per pair.	Easjos	\$3.00
1 1/2 "	3/4 "	2 1/2 "	Easkub	.20 "	Easinab	2.50 "	Easjote	4.00
1 3/4 "	1 1/4 "	3 "	Easkuls	.30 "	Easinec	3.25 "	Easjust	5.25
2 "	1 1/2 "	3 1/4 "	Easkyd	.30 "	Easinig	3.25 "	Easjuts	5.25
2 1/4 "	1 3/4 "	3 1/2 "	Easlaa	.30 "	Easinot	3.25 "	Easkad	5.25
2 1/2 "	2 "	4 "	Easlaet	.60 "	Easinul	6.50 "	Easkite	6.50
3 "	2 1/4 "	4 1/4 "	Easlib	.60 "	Easinyx	6.50 "	Easkog	6.50
3 1/2 "	2 1/2 "	5 1/4 "	Easligs	.75 "	Easjab	7.50 "	Easkome	7.50
5 "	2 3/4 "	7 1/4 "	Easlija	1.25 "	Easjik	10.00 "	Easkost	10.00

FIG. 77.

FIG. 76. FIG. 68.

# GOULDS ROD COUPLINGS AND GUIDES.

FIG. 515. WELL ROD JOINT AND BRASS BUSH.

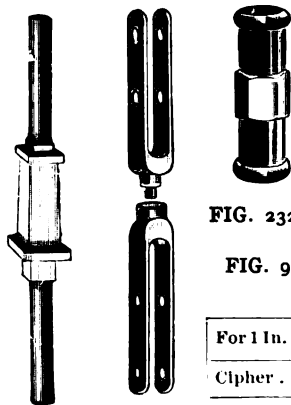


FIG. 232.

FIG. 9. MALLEABLE WOOD ROD COUPLING.

For 1 In. Square Rod.	Plain.	Galvanized.
Cipher . . . . .	Girting	Gladning
Per Pair . . . . .	.13	.17

Size Rod, Inches . . . .	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Cipher . . . . .	Getterst	Gilding	Gimmel	Girlish
Price . . . . .	\$1.20	\$1.38	\$1.75	\$2.45

FIG. 232. SCREW SOCKET ROD COUPLING.

Size, Inches . . . .	$\frac{3}{4}$	7-16	7-10 X $\frac{3}{4}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Threads to Inch . . . .	14	12	12 X 14	12	11	11
Malleable, per lb. . . .	.18	.18	.18	.18	.18	.18
Galvanized, per lb., . . .	.22	.22	.22	.22	.22	.22
Brass, per lb. . . . .	.45	.45	.45	.45	.45	.45

FIG. 515.

FIG. 9.

FIG. 516. SINGLE AND DOUBLE ROLLER GUIDES FOR PISTON RODS.

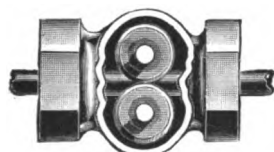


FIG. 901.

For Rod . . . .	$\frac{5}{8}$ OR $\frac{3}{4}$ IN.		$\frac{7}{8}$ IN.		1 IN.	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
Single Roller	Vesta	\$1.15	Vergont	\$1.50	Venumc	\$2.45
Double Roller	Versing	4.88				

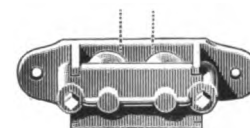


FIG. 516.

FIG. 901. ROLLER GUIDE OR COUPLING, FOR VERTICAL, HORIZONTAL OR INCLINED SUCTION PIPE.

For Pipe, Inches . . . .	1 $\frac{1}{2}$	2
For Rod, Inches . . . .	$\frac{1}{2}$	$\frac{1}{2}$
Cipher . . . . .	Crakbo	Crakcu
Price . . . . .	\$1.00	\$1.50

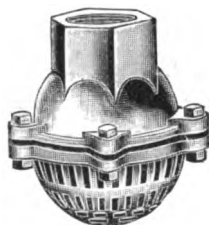
FIG. 771. MALLEABLE PIPE COUPLING WITH GUIDE.

Size Pipe, Inches . . . .	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Size Rod, Inches . . . .	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Cipher . . . . .	Gleaming	Gluing	Gracing	Grainy	Vertele
Price . . . . .	.75	\$1.00	\$1.25	\$2.00	\$2.75



FIG. 771.

Foot Valve.

FIG. 760, 2½ in. and up.  
Foot Valve.

Strainer.

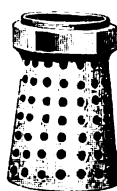
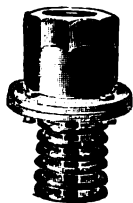
FIG. 471. FIG. 826.  
Foot Valve.

FIG. 473.

## CHECK AND FOOT VALVES, STRAINERS, ETC.

Foot Valve.



FIG. 760, ¼ to 2 in.

Check Valve.



FIG. 667.

Check Valve.



FIG. 742.

Strainer.



FIG. 222.

Foot Valve.

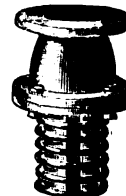


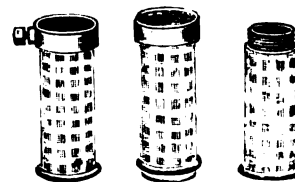
FIG. 475.

Check Valve.



FIG. 476.

Strainers.



FIGS. 658, 659, 660.

Size, Inches	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8
Fig. 471, Plain,	\$1.75	\$2.00	\$2.25	\$2.50	\$3.00	\$3.50	\$4.50	..	..	..	..	..
Galv.,	2.50	2.75	3.00	3.50	4.00	4.75	6.00	..	..	..	..	..
Fig. 760, Plain,	1.25	1.25	1.50	1.75	2.25	2.75	4.00	\$7.50	\$10.00	\$13.00	\$24.00	\$40.00
Galv.,	1.75	1.75	2.00	2.50	3.00	3.50	4.50	9.00	12.00	15.00	30.00	60.00
Fig. 826, Plain,	.40	.50	.75	.90	1.15	1.25	1.75	2.50	3.25	4.25	5.50	..
Galv.,	.90	1.00	1.25	1.75	2.50	2.75	3.25	3.50	4.50	5.75	7.50	..
Fig. 222, Plain,	..	.70	.75	.90	1.15	1.25	1.75	..	..	..	..	..
Galv.,	..	1.25	1.50	1.75	2.00	2.25	3.00	..	..	..	..	..
Fig. 742, Plain,	1.00	1.20	1.40	1.75	2.75	6.00	7.50	..	..	..	..	..
Galv.,	2.00	2.20	2.65	3.00	4.50	9.50	12.00	..	..	..	..	..
Fig. 667, Plain,	1.50	1.75	2.00	2.50	3.00	4.25	..	..	..	..	..	..
Galv.,	2.50	2.75	3.25	3.75	4.25	5.50	..	..	..	..	..	..

Size, Inches	2	2½	3	3½	4	4½	5	6
Fig. 473 . . .	..	\$4.75	\$5.75	\$7.00	\$8.50	\$10.00	\$12.00	\$15.00
Fig. 475 . . .	\$4.00	4.75	5.75	7.00	8.50	10.00	12.00	15.00
Fig. 476 . . .	4.25	5.00	6.00	7.25	8.75	10.50	12.75	16.00

Size, Inches	1	1¼	1½	2	2½	3
Fig. 658, Plain . . . . .	\$0.50	\$0.60	\$0.85	\$1.10	\$1.65	\$2.25
Galvanized . . . . .	.60	.85	1.10	1.65	2.25	2.75
Galvanized and Covered .	.85	1.10	1.65	2.25	2.75	3.25
Fig. 659, Plain . . . . .	.40	.50	.75	1.00	1.50	2.00
Galvanized . . . . .	.50	.75	1.00	1.50	2.00	2.50
Galvanized and Covered .	.75	1.00	1.50	2.00	2.50	3.00
Fig. 660, Plain . . . . .	.40	.50	.75	1.00	1.50	2.00
Galvanized . . . . .	.50	.75	1.00	1.50	2.00	2.50
Galvanized and Covered .	.75	1.00	1.50	2.00	2.50	3.00

## GOOSE NECKS OR SPOUTS.

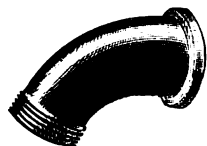


FIG. 492.



FIG. 407.



FIG. 493.

Fitted for Hose Coupling.	¾ INCH.		1 INCH.		1¼ INCH.		1½ INCH.		2 INCH.	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
Fig. 492, Flanged . . . . .	Glad	\$0.40	Gallant	\$0.40	Genera	\$0.50	Gagerl	\$0.60	Grasping	\$0.75
Fig. 493, " . . . . .	Gladder	.50	Gapal	.50	Getting	.65	Golden	.80	Grating	1.00
Fig. 407, Screwed, both ends	Gladdest	.50	Gauzy	.60	Gap	.90	Gouty	1.25	Grooming	1.50



FIG. 487.  
\$2.00.



FIG. 488.  
\$2.00.



FIG. 489.  
\$2.50.



FIG. 350.  
¾ in. \$2.00  
1 " 3.00  
1¼ " 5.00

## HYDRAULIC AIR CHAMBERS.

These Air Chambers may be used as Hydraulic Pressure Chambers on discharge pipes or as Vacuum Chambers on suction pipes. The importance of amply large and sufficiently strong chambers on long leads of pipe can hardly be over estimated. These Chambers can be adapted for use with any of our Suction and Force Pumps.

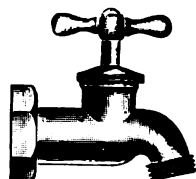


FIG. 1067.  
No. 1, \$2.00  
No. 2, 3.00

We illustrate our Iron Cocks with Brass Working Parts. Fig. 1067 is compression style, has iron case with brass valve stem, valve and seat, and is almost unaffected by use.

Fig. 490 has iron case with brass plug and lever handle. Either style can be used as follows: No. 1 Cock with Coupling Nut fits Air Chambers on our 2, 2½ and 3 inch House Force Pumps; also our Figs. 401, 402, 413, with threads cut for 1-inch hose couplings. No. 2 Cock with Coupling Nut fits Air Chambers on our 3½ and 4 inch House Force Pumps; also Figs. 237 and 593 with threads cut for 1¼-inch hose coupling.



FIG. 490.  
No. 1, \$2.00  
No. 2, 3.00

# GOULDS WIND MILL TANK VALVES.



FIG. 656.



FIG. 657.

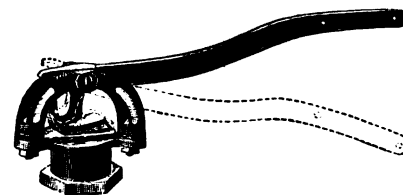


FIG. 172 1/2.

## FIGS. 656, 657. WIND MILL TANK VALVES.

SIZE, INCHES . . . . .	$\frac{3}{4}$		1		$1\frac{1}{4}$		$1\frac{1}{2}$		2	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
Fig. 656 . . . . .	Virelay	\$0.60	Virge	\$0.60	Virgo	\$0.75	Serfing	\$0.90	Grafting	\$1.25
Fig. 657 . . . . .	Virent	.80	Virgin	.80	Virile	1.00	Grubber	1.25	Kidding	1.50

## FIG. 172 1/2. TANK VALVE.

SIZE, IN.	¾		1		1¼		1½		2		2½		3	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
	Dotgiss	\$1.25	Dotgoe	\$1.38	Dotgood	\$1.50	Dotgome	\$3.00	Dotgond	\$5.00	Dotgost	\$7.50	Dotgoud	\$10.00

## Fig. 172 1/2 (continued).

SIZE, INCHES . . . . .	4		5		6		7		8	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
Screwed, each . . . . .	Dotgove	\$22.00	Dotgudy	\$32.00	Drackid	\$45.00	Dracleb	\$60.00	Draciot	\$75.00
Flanged . . . . .	Dotgub	25.00	Dotguff	36.00	Draciad	50.00	Dracis	65.00	Dracluv	80.00

## Fig. 78. Wind Mill Connecting Slide (Dablam), each \$0.50.

Fig. 84. No. 1. Wind Mill Forked Rod for 2, 2 1/2, 3, 3 1/2, and 4 in. Pumps (Direga), \$1.50.  
 Fig. 84. No. 2. " " " " " 4 1/2, 5, 5 1/2 and 6 in. Pumps (Diteym), \$2.50.

FIG. 78.

FIG. 84.

## PIPE SADDLES.

These Pipe Saddles, Fig. 1046, can be attached to water mains at any desired points where additional connections are wanted and save the trouble and expense of putting in tees, etc.

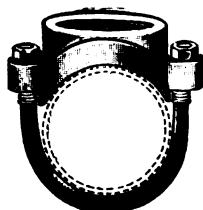


FIG. 1046.

SADDLE FOR PIPE . . . . .	2 in.	2 1/2 in.	3 in.	3 1/2 in.	4 in.	4 1/2 in.	5 in.	5 1/2 in.	6 in.	7 in.	8 in.
Price, each . . . . .	\$0.75	\$0.80	\$1.00	\$1.00	\$1.25	\$1.25	\$1.25	\$1.25	\$1.50	\$1.75	\$2.00



## DEEP WELL PUMPING.

How to obtain a water supply from deep wells is a matter of growing interest. In some localities deep wells are depended upon for the entire supply of water; in others, the deep well furnishes the only available supply of pure water. In any case the value and usefulness of the deep well depend upon the facilities for getting water out of it.

Our Differential Power Working Heads, illustrated and described on the following pages, operating our Deep Well Pumps, are an effective and convenient apparatus for pumping water from deep wells. The working parts are few; all are readily accessible and easily kept in running order. They combine strength, durability, and convenience with the most efficient and economical means of applying power to pumping from deep wells.

A partial range of working depths and capacity to deliver water when operating Deep Well Pumps is given with each type of Working Head. Pumps of smaller diameter may be operated at greater depths or Pumps of larger diameter at less depths.



# DIRECTIONS FOR PLACING AND OPERATING

## GOULDS DIFFERENTIAL WORKING HEADS AND DEEP WELL PUMPS.

To assemble the parts at the well: first, bolt the bed-plate to timber or masonry at the surface. The pump cylinder is screwed to the connecting pipe and lowered into the well through the bed-plate. The discharge piece is screwed to the connecting pipe and then bolted to bed-plate. The pump plunger, valve rod and sucker rod are next lowered into place; the differential plunger is attached to sucker rod; the stuffing box is slipped over the plunger and bolted to discharge piece. The frame, carrying the pulleys, gearing, crank shaft and connecting rod, is then bolted to bed-plate; the differential plunger is attached to the connecting rod, and the Working Head is ready for operation. When the rods, plunger or lower valve require attention, these parts can all be drawn out after removing the frame and the stuffing box of the working head and without disturbing the bed-plate or disconnecting the pipes.

All our Differential Working Heads are regularly fitted with tight and loose pulleys to be driven by belt, motive power being derived from any convenient line shaft, from gas, petroleum or steam engine, from electric motor or water wheel. Sprocket wheels for link belt or grooved pulleys for rope will be furnished if specified.

# GOULDS DIFFERENTIAL POWER WORKING HEAD.

FOR OPERATING DEEP WELL PUMPS.

Fig. 1030 is a neat, strong Working Head, serviceable, convenient and easy to keep in running order. The design is similar to that of Fig. 971 (page 99), yet of lighter build and lesser range of capacity. It has tight and loose pulleys to be driven by belt from any source of power, and a differential plunger which causes the water to flow from the well in a continuous stream; heavy shaft and pitman with ample bearings, machine finished gear and pinion. It will be found specially valuable on the farm and ranch for irrigating land, watering stock, filling tanks, etc.

Fig. 904, Brass Deep Well Pump, is specially designed to be used with this type of Working Head. See pages 88 and 89 for complete description.

• Selection of Deep Well Pump will be governed by quantity of water required, bore and depth of well. We recommend the use of wood sucker rod with forged couplings, listed page 90.

FIG. 1030.

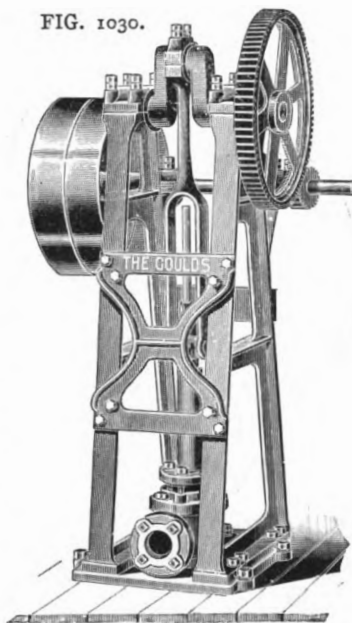


FIG. 1030. WORKING HEAD. SIZE, PRICE, ETC.

Stroke.	MAXIMUM SIZE OF PIPE.		Geared.	Pulleys, Each.	Cipher.	Price.
	Connecting.	Discharge.				
10 in.	6 in.	3 in.	5 to 1.	20 x 4 in.	Vatful	\$120.00

FIG. 904. BRASS DEEP WELL PUMP. SIZES, PRICES, CAPACITIES, ETC.

Fig. 904. Diameter and Stroke.	† Fig. 1030 will oper- ate in Wells.	Capacity per Stroke.	Proper Speed and Capacity per Min.	Connect- ing Pipe.	Inside Diameter of Well Casing.	Square Wood Sucker Rod.	Cipher.	Price.
2½ x 10 in.	350 ft.	.172 gals.	25 strokes — 4.3 gals.	2½ in.	4½ in.	1½ in.	Dumpol	\$22.00
2½ x 10 "	275 "	.257 "	25 " — 6.4 "	3 "	4½ "	1½ "	Dumpy	28.00
3½ x 10 "	200 "	.359 "	30 " — 10.7 "	3½ "	5.3-16 "	2 "	Dumbyb	46.00
3½ x 10 "	150 "	.478 "	30 " — 14.3 "	4 "	5½ "	2¼ "	Dumgeel	65.00
4½ x 10 "	120 "	.614 "	30 " — 18.4 "	4½ "	6¼ "	2½ "	Dumqued	85.00
4½ x 10 "	100 "	.767 "	30 " — 23.0 "	5 "	6½ "	3 "	Dumquil	120.00
5½ x 10 "	70 "	1.12 "	30 " — 33.6 "	6 "	8½ "	3½ "	Dubame	155.00

† Depth of the well from surface of water supply to point of delivery.



# GOULDS DIFFERENTIAL POWER WORKING HEAD.

FIG. 835.

FOR OPERATING DEEP WELL PUMPS.

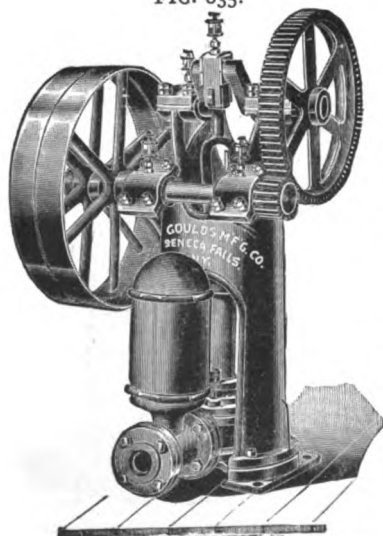


Fig. 835 is a compact, strong Working Head, arranged to be driven by belt from any source of power. It has a considerable capacity and will be found useful as a local water supply for manufacturing and domestic purposes, for irrigating lands, etc. The differential plunger effects a steady delivery from the well. It has tight and loose pulleys, machine finished gear and pinion, steel crank shaft, strap head crank bearing with phosphor-bronze boxes.

Fig. 904, Brass Deep Well Pump, is specially designed to be used with this type of Working Head. See pages 88 and 89 for complete description.

Selection of Deep Well Pump will be governed by quantity of water required, bore and depth of well. We recommend the use of wood sucker rod with forged couplings, listed page 90.

FIG. 835. WORKING HEAD. SIZE, PRICE, ETC.

Stroke.	MAXIMUM SIZE OF PIPE.		Geared.	Pulleys, Each.	Cipher.	Price.
	Connecting.	Discharge.				
10 in.	6 in.	3 in.	5 to 1.	26 x 3 in.	Warrior	\$175.00

FIG. 904. BRASS DEEP WELL PUMP. SIZES, PRICES, CAPACITIES, ETC.

Fig. 904. Diameter and Stroke.	† Fig. 835. will operate in Wells.	Capacity per Stroke.	Proper Speed and Capacity per Min.	Connecting Pipe.	Inside Diameter of Well Casing.	Square Wood Sucker Rod.	Cipher.	Price.
2½ x 10 in.	500 ft.	.172 gals.	20 strokes — 3.4 gals.	2½ in.	4½ in.	1½ in.	Dumpol	\$22.00
2½ x 10 "	350 "	.257 "	20 " — 5.1 "	3 "	4½ "	1½ "	Dumpuy	28.00
3½ x 10 "	275 "	.359 "	25 " — 8.9 "	3½ "	5 3-16 "	2 "	Dumpyb	46.00
3½ x 10 "	200 "	.478 "	25 " — 11.9 "	4 "	5½ "	2½ "	Dumqeel	65.00
4½ x 10 "	150 "	.614 "	30 " — 18.4 "	4½ "	6½ "	2½ "	Dumqued	85.00
4½ x 10 "	125 "	.767 "	30 " — 23.0 "	5 "	6½ "	3 "	Dumquil	120.00
5½ x 10 "	100 "	1.12 "	30 " — 33.6 "	6 "	8½ "	3½ "	Dubame	155.00

† Depth of the well from surface of water supply to point of delivery.

# GOULDS DIFFERENTIAL POWER WORKING HEAD.

FOR OPERATING DEEP WELL PUMPS.

FIG. 971.

Fig. 971 is our leading and model type of Power Working Head. It has a substantial bed plate to which the discharge-piece and frame are bolted. For access to the well, the frame can be pushed back on the bed plate by means of a screw provided for that purpose. It has the differential plunger to equalize the flow of water and insure smooth running. The connecting rod and crank shaft are of forged steel; crank bearing has strap head with phosphor-bronze box. Gear and pinion are machine finished. Tight and loose pulleys are regularly supplied for belt drive from any source of power.

Fig. 904, Brass Deep Well Pump, is specially designed to be used with this type of Working Head. See pages 88 and 89 for complete description.

Selection of Deep Well Pump will be governed by quantity of water required, bore and depth of well. We recommend the use of wood sucker rod with forged couplings, listed page 90.

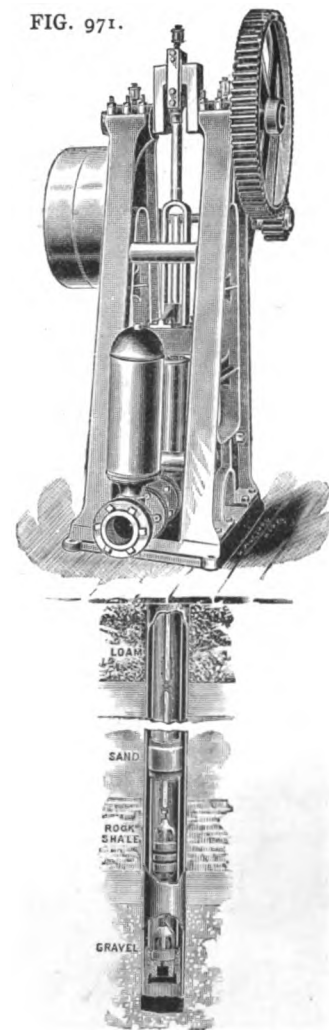
FIG. 971. WORKING HEAD. SIZE, PRICE, ETC.

Stroke.	MAXIMUM SIZE OF PIPE.		Geared.	Tight and Loose Pulleys.	Clpher.	Price.
	Connecting.	Discharge.				
16 in.	8 in.	4 in.	5 to 1	30 x 6 in.	Writ	\$400.00

FIG. 904. BRASS DEEP WELL PUMP. SIZES, PRICES, CAPACITIES, ETC.

Fig. 904. Diameter and Stroke.	†Fig. 971 will oper- ate in Wells.	Capacity per Stroke.	Proper Speed and Capacity per Min.	Connect- ing Pipe.	Inside Diameter of Well Casing.	Square Wood Sucker Rod.	Clpher.	Price.
2 1/2 x 16 in.	550 ft.	.411 gals.	20 strokes. — 8.2 gals.	3 in.	4 1/2 in.	1 1/2 in.	Whilom	\$32.00
3 x 16 "	500 "	.489 "	20 " — 9.7 "	3 1/2 "	5 3/16 "	1 3/4 "	Whilst	45.00
3 1/4 x 16 "	450 "	.574 "	25 " — 14.3 "	3 1/2 "	5 3/16 "	2 "	Whim	50.00
3 1/2 x 16 "	400 "	.764 "	25 " — 19.0 "	4 "	5 1/2 "	2 1/4 "	Zylonkk	70.00
4 1/4 x 16 "	350 "	.982 "	25 " — 24 "	4 1/2 "	6 1/4 "	2 1/2 "	Zylonle	90.00
4 1/2 x 16 "	300 "	1.227 "	25 " — 30 "	5 "	6 1/2 "	3 "	Zylonm	125.00
5 1/4 x 16 "	200 "	1.798 "	30 " — 53 "	6 "	8 1/4 "	3 1/2 "	Zylonna	160.00
7 1/4 x 16 "	125 "	3.266 "	30 " — 97 "	8 "	9 3/8 "	5 "	Zylonoc	350.00

† Depth of the well from surface of water supply to point of delivery.



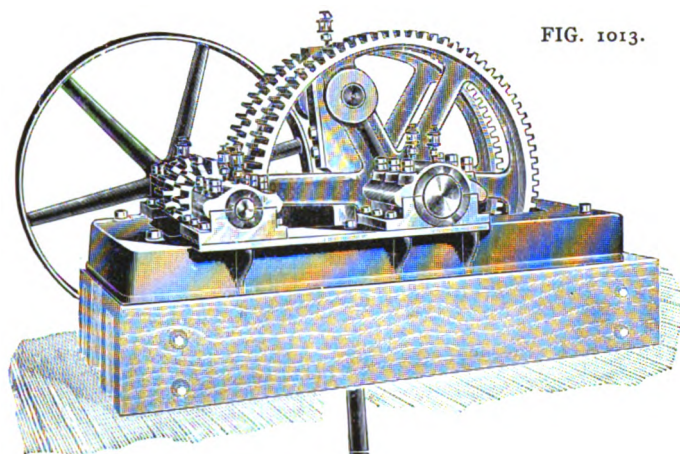


FIG. 1013.

## GOULDS DIFFERENTIAL POWER WORKING HEAD

### AND DOUBLE-GEARED DRIVING SHAFT.

FOR OPERATING DEEP WELL PUMPS.

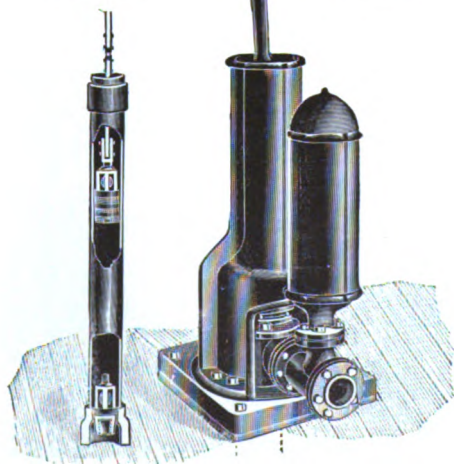
THIS apparatus is somewhat different from the Working Heads described on the preceding pages, but it embodies the same general principles. It is heavier and has a greater range of application and capacity.

**Fig. 1014**, Power Working Head, is attached to the well curb. It has a heavy bed-plate to which the guide-frame and discharge piece are bolted and differential plunger for equalizing the flow of water.

**Fig. 1013**, Double-Geared Driving Shaft, is mounted on a heavy cast-iron frame in one piece, to which the pillow blocks of the main and pinion shafts are bolted in accurate alignment. The crank-pin is carried between and supported at each end by arms of the two gears. The connecting rod may be of any

FIG. 904.

FIG. 1014.



convenient length. It has strap-ends with phosphor-bronze boxes. The pinion shaft can be fitted to carry any kind of driving pulley or gear, as desired.

This Gear Driving Shaft is ordinarily arranged to drive one Deep Well Pump, but can be arranged to drive two or three Pumps, forming a Duplex or Triplex Pumping Engine for use in open wells. We confidently recommend it in such form for the water supply of towns, villages and for manufacturing purposes.

**Fig. 904.** Brass Deep Well Pump, is especially designed to be used with this type of Working Head. See pages 88 and 89 for complete description.

Selection of Deep Well Pump will be governed by quantity of water required, bore and depth of well. We recommend the use of wood sucker rod with forged couplings, listed page 90.

**FIG. 1014. POWER WORKING HEAD.  
SIZES, ETC.**

Stroke.	MAXIMUM SIZES OF PIPE.		Cipher.	Price.
	Connecting.	Discharge.		
20 in.	8 in.	5 in.	Rousing Rousing	\$165.00
28 "	8 "	5 "		170.00

**FIG. 1013. GEARED DRIVING SHAFT.  
SIZES, ETC.**

Stroke.	Geared.	Pulley.	Cipher.	Price.
20 in.	4.7 to 1	42 x 8 in.	Railing Ranting	\$550.00
28 "	4.7 to 1	48 x 10 "		570.00

**FIG. 904. BRASS DEEP WELL PUMP. SIZES, CAPACITIES, ETC.**

Fig. 904. Diameter and Stroke.	*Fig. 1013 will operate in Wells.	Capacity per Stroke.	Proper Speed and Capacity per Min.	Con- necting Pipe.	Inside Diameter of Well Casing.	Square Wood Sucker Rod.	Cipher.	Price.
3¼ x 20 in.	640 ft.	0.95 gals.	20 strokes. — 18.0 gals.	4 in.	5½ in.	2¼ in.	Duband	\$72.50
3½ x 28 "	640 "	1.34 "	20 " — 26.8 "	4 "	5½ "	2¼ "	Dubape	80.00
4¼ x 20 "	500 "	1.23 "	20 " — 24.6 "	4½ "	6½ "	2½ "	Dubard	92.50
4½ x 28 "	500 "	1.72 "	20 " — 34.4 "	4½ "	6½ "	2½ "	Duelfan	97.50
4¾ x 20 "	400 "	1.53 "	25 " — 38.2 "	5 "	6½ "	3 "	Duelfut	127.50
4¾ x 28 "	400 "	2.1 "	25 " — 52.5 "	5 "	6½ "	3 "	Duelfyl	132.50
5¼ x 20 "	270 "	2.2 "	25 " — 55 "	6 "	8½ "	3½ "	Dufad	162.50
5½ x 28 "	270 "	3.1 "	25 " — 77.5 "	6 "	8½ "	3½ "	Dufact	170.00
7¼ x 20 "	150 "	4.0 "	30 " — 120 "	8 "	9½ "	5 "	Dufale	375.00
7½ x 28 "	150 "	5.6 "	30 " — 168 "	8 "	9½ "	5 "	Dufami	450.00

\* Depth of the well from surface of water supply to point of delivery.

FIG. 650.

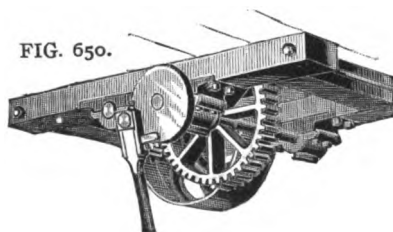


FIG. 978.

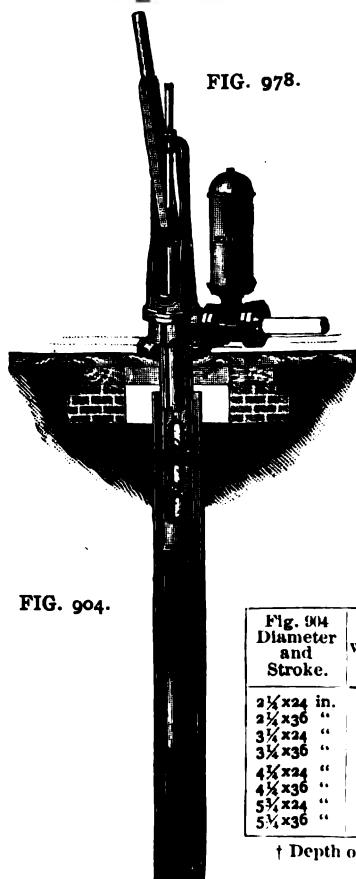


FIG. 904.

# GOULDS DIFFERENTIAL POWER WORKING HEAD

## AND GEARED DRIVING SHAFT.

FOR OPERATING DEEP WELL PUMPS.

Fig. 978, Differential Working Head, is a strong, serviceable device to be used with our Fig. 650 Geared Driving Shaft, or other means of driving, for operating Fig. 904 Deep Well Pumps. It is adapted to a wide variety of conditions as to depth of well and diameter and stroke of Pump.

Fig. 650, Over-head Geared Driving Shaft, is a convenient shop or factory driving mechanism for deep well Pumps. It is strongly framed of heavy timber, complete and ready to place in position. It can be secured to timbers from beneath, as shown in our illustration, or it may be placed upon and secured to timbers from above.

Fig. 904, Brass Deep Well Pump, is specially designed to be used with this type of Working Head. See pages 88 and 89 for complete description.

Selection of Deep Well Pump will be governed by quantity of water required, bore and depth of well. We recommend the use of wood sucker rod with forged couplings, listed page 90.

FIG. 978. WORKING HEAD.  
SIZES, PRICES, ETC.

Stroke.	MAXIMUM SIZE OF PIPE.		Cipher.	Price.
	Con.	Dis.		
10 in.	6 in.	4 in.	Altrical	\$90.00
12, 16, 18 "	6 "	4 "	Altrices	95.00
20, 22, 24 "	6 "	4 "	Capers	100.00
26, 28, 30 "	6 "	4 "	Careful	115.00
36 "	6 "	4 "	Watery	135.00

FIG. 650. GEARED DRIVING SHAFT.  
SIZES, PRICES, ETC.

Stroke.	Geared.	Pulley.	Cipher.	Price.
10 in.	2.8 to 1	22x5½ in.	Beef	\$125.00
12, 16, 18 "	2.8 to 1	22x5½ "	Cason	140.00
20, 22, 24 "	2.8 to 1	22x5½ "	Casort	150.00
26, 28, 30 "	2.8 to 1	22x5½ "	Cheatad	160.00
36 "	2.8 to 1	22x5½ "	Altruia	175.00

FIG. 904. DEEP WELL PUMP. SIZES, PRICES, CAPACITIES, ETC.

Fig. 904 Diameter and Stroke.	† Fig. 650 will operate in Wells.	Capacity per Stroke.	Proper Speed and Capacity per Min.	Connect- ing Pipe.	Inside Diameter of Well Casing.	Square Wood Sucker Rod.	Cipher.	Price.
2¼x24 in.	300 ft.	0.41 gals.	20 strokes. — 8.2 gals.	2½ in.	4¼ in.	1½ in.	Woodic	\$30.00
2½x36 "	250 "	0.61 "	20 " — 12.2 "	2½ "	4½ "	1½ "	Dufear	34.00
3¼x24 "	200 "	0.86 "	25 " — 21.5 "	3½ "	5 3-16 "	2 "	Whine	55.00
3½x36 "	200 "	1.30 "	25 " — 32.5 "	3½ "	5 3-16 "	2 "	Whoop	65.00
4¼x24 "	150 "	1.47 "	25 " — 36.7 "	4½ "	6¼ "	2½ "	Whinny	95.00
4½x36 "	150 "	2.21 "	25 " — 55.2 "	4½ "	6½ "	2½ "	Widen	110.00
5¼x24 "	75 "	2.69 "	30 " — 80.7 "	6 "	8¼ "	3½ "	Dufebi	165.00
5½x36 "	75 "	3.90 "	30 " — 117 "	6 "	8½ "	3½ "	Wight	195.00

† Depth of well from surface of water supply to point of delivery.



# DEEP WELL STEAM PUMPING ENGINE.

These Engines are adapted for non-flowing, Artesian, tubular, bored, dug or driven wells. They are constructed so as to insure a steady flow of water, whether raised from shallow or deep wells, there being separate adjustments for the upward and downward strokes; therefore a perfect travel of piston is obtained without regard to the weight of the reciprocating parts.

The Valve Gear governing the operation of the Engine is not connected with the auxiliary piston or valve, and has no upward or downward movement, consequently the weight of the piston and valve rod, to which the tappets are attached, are not dependent upon the action of the steam to govern their relative positions to that of the main piston at different points of the stroke.

The breaking of the pump poles due to the sudden reversal motion is avoided in our Deep Well Engines, as the adjustment can be so made that the reversal motion will be slow and easy at either end, thus allowing the Pump to properly fill. This design of Deep Well Engine is particularly adapted for Water Works service, either on reservoir or direct-pressure systems, or for domestic or factory use, where water is to be forced to a considerable elevation.

The Combined Air Chamber and Check Valve shown in connection with the Deep Well Pumping Engine in outline are so constructed as to avoid air-pockets, water hammer and consequent jar of pipe. It is furnished only at additional cost over that of the Deep Well Engine. Sight Feed Lubricator, Drain Cocks, Plugs and Spanner Wrench are furnished with each outfit.

FIG. 1057. SIZES, PRICES, ETC.

STEAM CYL.		Steam Pipe.	Exhaust Pipe.	STEAM END ONLY.	
Dia.	Stroke.			Cipher.	Price.
5 in.	24 in.	¾ in.	1 in.	Mobaca	\$225.00
5 "	36 "	¾ "	1 "	Mobadu	250.00
6 "	24 "	1 "	1 ¼ "	Mobafs	250.00
6 "	36 "	1 "	1 ¼ "	Mobago	300.00
7 "	24 "	1 ¼ "	1 ½ "	Mobick	300.00
7 "	36 "	1 ¼ "	1 ½ "	Mobopa	315.00
8 "	24 "	1 ¼ "	1 ½ "	Moboqu	315.00
8 "	36 "	1 ¼ "	1 ½ "	Mobuda	325.00
9 "	24 "	1 ½ "	2 "	Mobuel	325.00
9 "	36 "	1 ½ "	2 "	Mobufu	350.00
10 "	24 "	1 ½ "	2 "	Mobugs	350.00
10 "	36 "	1 ½ "	2 "	Mobuim	375.00
11 "	24 "	2 "	2 ½ "	Mobujg	415.00
11 "	36 "	2 "	2 ½ "	Mobuka	450.00
12 "	24 "	2 "	2 ½ "	Mobulm	450.00
12 "	36 "	2 "	2 ½ "	Mobumo	500.00
14 "	24 "	2 "	2 ½ "	Mobund	675.00
14 "	36 "	2 "	2 ½ "	Moburt	750.00

See pages 88 to 90 for Cylinders, Rods, Couplings, etc., to use with this Steam Head.

Sizes and Prices of Combined Air Chambers and Discharge Check Valves.

Size, Well.	Size, Check Valve.	Price.
3 in. and smaller.	2 in.	\$12.00
3 ½ "	2 ½ "	14.00
4 "	2 ½ "	14.00
4 ½ "	3 "	16.25
5 "	3 "	16.25
6 "	3 ½ "	21.00
7 "	3 ½ "	21.00
8 "	4 "	24.50
10 "	5 "	27.00

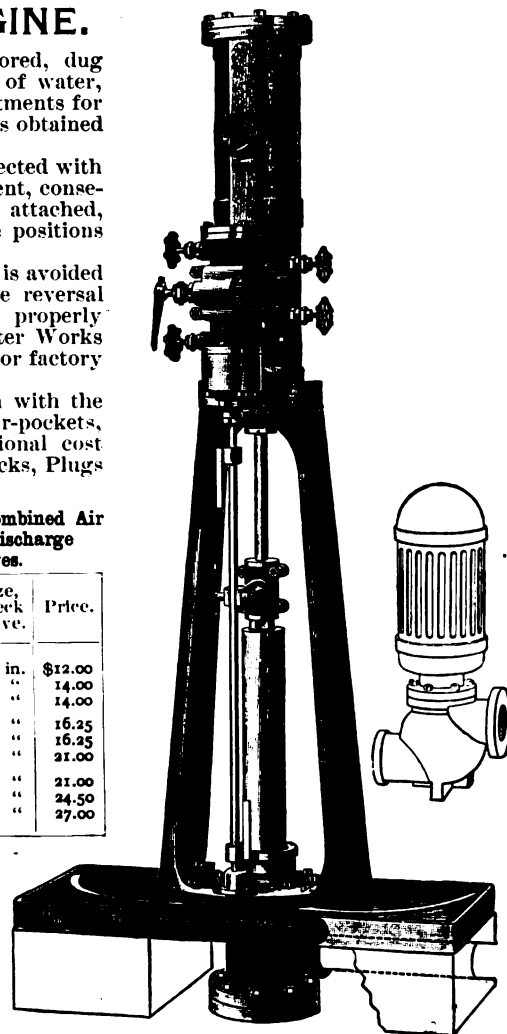
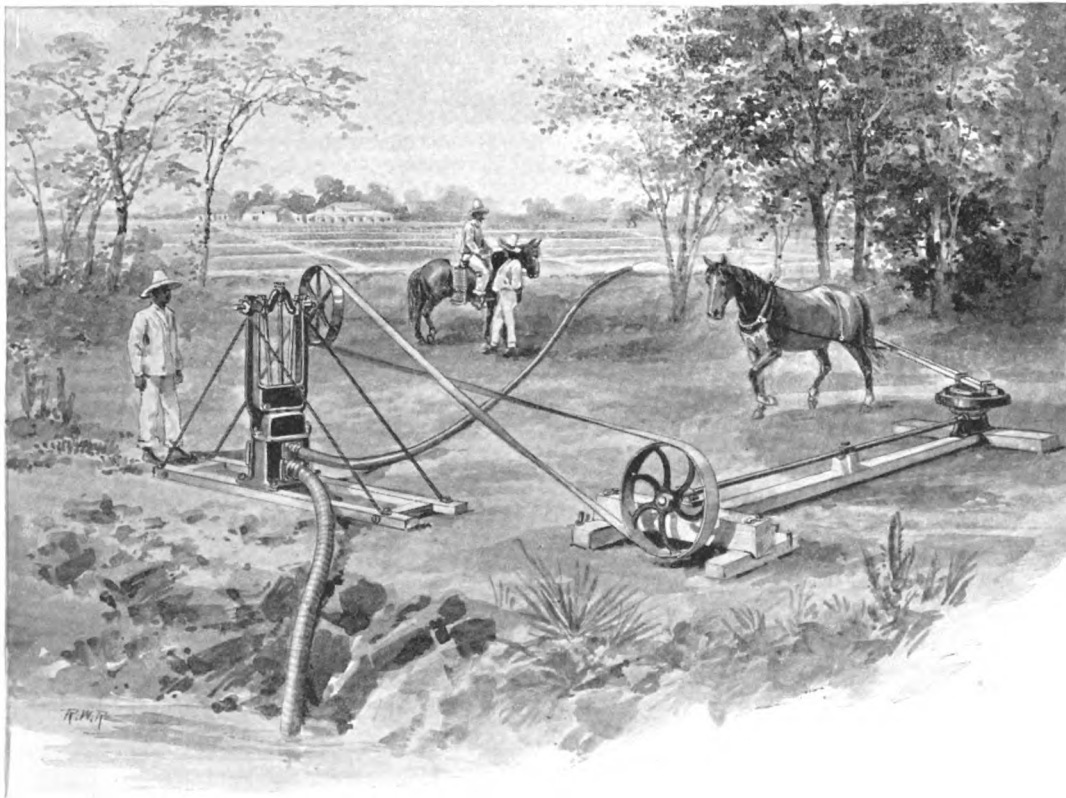


FIG. 1057.



Of all known and tried means of irrigating small tracts of land, nothing has ever equalled a Power Force Pump operated by Horse Power, in points of general usefulness and economy.

Where water supply is taken from shallow creeks or wells, Triplex Irrigating Pump, operated by Double-gearred Iron Horse Power with Jack Shaft, as shown above, presents a most simple, durable and withal cheap outfit. Same Horse Power may be employed for kindred other services, while Pump fitted with smaller hose and nozzle can be converted to an effective Force Pump or Fire Engine.

**Fig. 914**, Horse Power, will be found, page 108. **Fig. 1010**, Irrigating Pump, page 181. Other styles of Horse Powers, Pumps, etc., for both shallow and deep wells, will be found between pages 107 and 117.

## IRRIGATION BY PUMPING.

It is but few years since the Great American Desert was marked upon the maps of the United States to cover a large area of country, to-day made fertile and productive by irrigation. Dating from the successes of Salt Lake City and the Union Colony at Greeley, Colorado, the reclaiming of this vast territory by irrigation has been of growing import. The whole problem has resolved itself into the question of water supply, the land generally possessing plant food to a marked degree. What was once a measure of necessity in this region has been found an advantage in other sections where the rainfall is insufficient and unreliable, and irrigation has supplied the shortage. To those who are obliged to raise water for irrigation from shallow streams or wells, we offer a complete line of Pumps and appliances. These are not all grouped in one section of our catalogue, but will treat with some detail. Between pages 107 and 117 are found our line of Horse Powers and Pumps to be operated by these Powers. While the use of these outfits is confined to rather narrow limits, still their usefulness and economy should not be underestimated. We refer to illustrations, descriptions, etc.

Among our other Pumps which may be operated by belt from Horse Power Jack Shaft, Steam or Oil Engine, Electric Motor or other power, we call special attention to our line of Triplex Power Pumps, notably **Fig. 1010**, for elevations to 50 ft., see page 181; **Fig. 957**, for elevations to 100 ft., see page 187; **Fig. 924**, for elevations to 300 ft., see page 189. These Pumps have a general application where water supply is not more than 20 to 25 feet below Pump, and afford the most economical and efficient method of pumping. The advantages and adaptations of these Pumps are fully described under the figures on pages to which we refer. Where the source of water is from deep well, the following Working Heads and Cylinders are especially desirable:—

**Figs. 1030** and **835** (see pages 97 and 98) are adapted to wells of moderate depth and capacity; while **Fig. 971** (page 99) is designed for deeper and larger wells. Any of our Working Cylinders may be used with these Heads, but we particularly recommend our **Fig. 904** Artesian Cylinder (see pages 88 and 89).

Notice that these outfits are self-contained, doing away with expensive counter shafts, out-riggers, etc. Where Working Heads of longer stroke and greater capacity are desired, our **Figs. 650** and **978** (page 102), **Figs. 1013** or **1014** (see pages 100 and 101), in connection with **Fig. 904** (pages 88 and 89), can be employed.

Estimates for quantity of water required for successful irrigation will be influenced by the character and condition of the soil; some requiring only one gallon per acre per minute through the irrigating season, while a very light porous soil will require double that quantity. In this connection we give a few tables which will be found of special interest. We solicit correspondence and are always pleased to afford any information in our power.

# IRRIGATION TABLE

Giving Capacity in gallons per Hour of our different sizes Pumps and Equivalent in Miners' Inches and Irrigating Acreage.  
Also Power required per foot lift.

Gallons per Hour.	Miners' Inches.	Number of Acres will cover 1 inch deep in 10 Hours.	Approximate Horse Power required per foot lift.
500	42	.019	.004
1,000	84	.37	.007
1,500	125	.55	.01
2,000	167	.74	.014
2,500	217	.92	.017
3,000	250	1.11	.02
3,500	292	1.28	.024
4,000	333	1.4	.027
4,500	375	1.66	.03
5,000	417	1.8	.034
6,000	500	2.2	.04
7,000	583	2.5	.047
8,000	667	3.	.054
9,000	750	3.3	.06
10,000	833	3.7	.067
15,000	1,250	5.5	.1
20,000	1,666	7.4	.134
25,000	2,083	9.2	.167
30,000	2,500	11.1	.2

NOTE. — As stated, a miners' inch of water is considered in these tables as 12 U. S. gallons per minute. If considered as 9 U. S. gallons per minute, increase our estimate one third. Our estimate of approximate horse power required per foot lift also makes an allowance of 50 per cent for friction of water in pipes, etc. The efficiency of small engines or motors of any type cannot be safely accepted on as close estimates as larger powers.

Table of Discharge of Water over Weirs one inch wide, in gallons per Minute.

Depth, inches . . . . .	$\frac{1}{2}$	1	2	3	4	5	6	7	8	9	10	12	18	24	30
Gallons . . . . .	1.14	3.2	9.1	16.7	25.7	35.4	47.2	59.6	72.8	86.5	101.7	133.7	245.7	378.2	516.6

Approximate Heights Pumps may be Worked by Pony or Horse Gear.

The pony or horse in each case being estimated to walk at the rate of 3 miles per hour.

Diameter of Working Barrel or Cylinder, inches .	2½	3	3½	4	5	6
Single-Barrel Pump worked by Pony Gear . . . .	260 ft.	175 ft.	135 ft.	100 ft.	64 ft.	44 ft.
Double-Barrel " " " " . . . .	130 "	88 "	68 "	50 "	32 "	22 "
Single-Barrel Pump worked by Horse Gear . . . .	520 "	350 "	270 "	200 "	128 "	88 "
Double-Barrel " " " " . . . .	260 "	176 "	136 "	100 "	64 "	44 "

The above calculations are based upon strong, powerful horses or ponies being used. If inferior animals are substituted the heights given will of course not be attained.

# COMBINED HORSE POWER AND "CHALLENGE" PUMP.

FOR SHALLOW WELLS OR STREAMS.

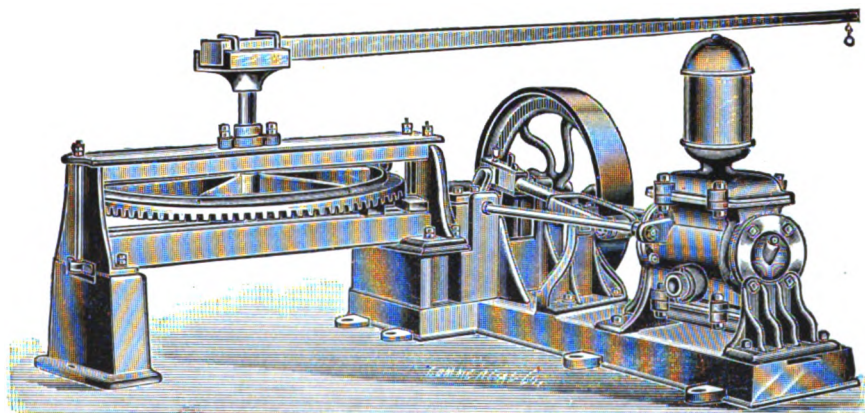


FIG. 790.

**Fig. 790** represents our "Challenge" Double-Acting Force Pump connected to Strong Pony or Horse Power. This combination is mounted on iron bed plate, is strong and self-contained, and is complete with face plate, pitman, guide, rod, etc. Pump cylinder is brass-lined and the valves, valve seats and piston rod are also of brass.

We recommend this apparatus for pumping water for irrigation purposes, etc., and by connecting leading hose and discharge pipe, an efficient fire engine can be had. Pump should not be more than 25 feet above the water.

Repairs can easily be made by unscrewing brass nuts at the side of air chamber, which allows pump to be readily taken apart.

FIG. 790. SIZES, PRICES, ETC.

No.	Diameter of Cylinder.	Stroke.	Capacity per Revolution.	Suction.	Discharge.	* Lift and Force.	Cipher.	Price.
12	5 in.	5 in.	.85 gal.	2 in. hose.	1½ in. hose.	25 ft.	Volley	\$175.00
16	6 "	5 "	1.22 "	2½ "	2 "	25 "	Volow	190.00

\* Total lift and force from water to point of discharge.

# GOULDS DOUBLE GEARED IRON HORSE POWER.

FOR ONE OR TWO HORSES.

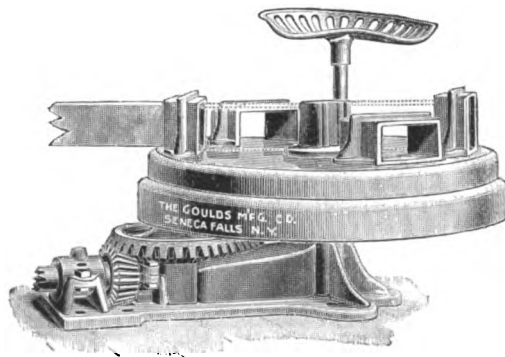


FIG. 914.

THE illustration shows a very powerful Double Geared Iron Horse Power for one or two horses, with covered internal master gear, two babbitted 1½-inch journal boxes, driver's seat, pole and all necessary details.

This Horse Power is geared about 14 to 1. The usual travel of horse or other animal is 3 to 4 circuits per minute, giving the Tumbling Shaft a speed of from 40 to 50 revolutions per minute. By providing extra length wrought-iron Tumbling-Shaft, Plummer Blocks and Driving Pulley at end (which we list below), this Power may be employed for driving our **Fig. 1010**, Triplex Irrigating Pump (illustrated on page 181) or other Power Pump. Of course it has a wide range of application for other duties where horse power can be employed.

Horse Power alone weighs about 550 pounds. Sweeps about 60 pounds each.

FIG. 914. PRICES, ETC.

Iron Horse Power, with one pole — for one horse . . . . .	(Weir) . . . . .	\$90.00
Iron Horse Power, with two poles — for two horses . . . . .	(Weir) . . . . .	93.00
With 10 feet 2 inch Wrought-Iron Tumbling Shaft and face plate at end, for 6, 8 and 10 inch stroke, extra . . . . .		10.00
With 10 feet 2 inch Wrought-Iron Tumbling Shaft and 30 x 6 Driving Pulley at end, and 2 Plummer Blocks, extra . . . . .		20.00
2-inch Wrought-Iron Tumbling Shaft, per foot extra . . . . .		.75
Air Chamber with Tee for 3-inch pipe, extra . . . . .		7.50
Heavy Balance Wheel, 36 x 4½ inch, extra . . . . .		12.00
Plummer Blocks, extra . . . . .		3.00

# COMBINED HORSE POWER AND TRIPLEX PUMP.

FOR IRRIGATING LANDS, WATER SUPPLY, ETC.

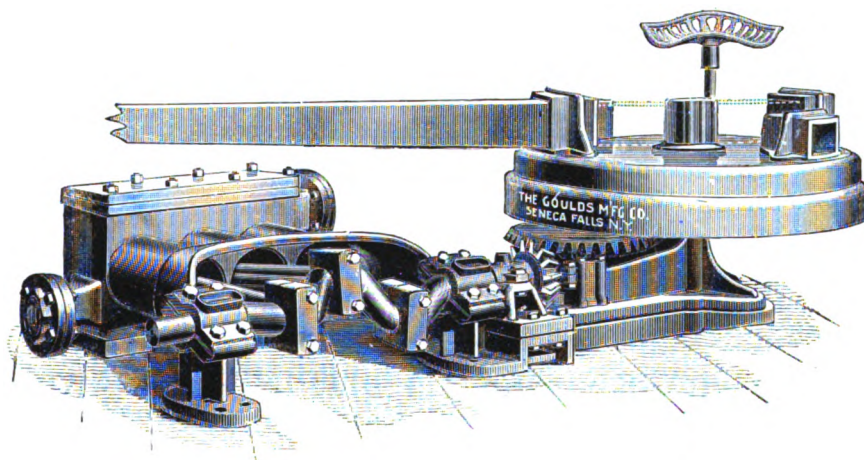


FIG. 915.

We illustrate above a combination of Horse Power, described on opposite page, and our Horizontal Triplex Suction and Force Pump — a complete and self-contained pumping apparatus for the Ranchman or Farmer. At 50 revolutions it will furnish 4,500 gallons per hour — sufficient for a large number of cattle or to irrigate an extensive surface of land. There is absolutely nothing that can give out, as all parts are massive and compact. Pump can be disconnected and Power used for other purposes, if desired.

Pump capable of any duty for which one or two horses can exert necessary power. An Air Chamber in delivery pipe, if forcing water to any considerable elevation, is advantageous.

FIG. 915. SIZES, PRICES, ETC.

	Diameter of Cylinder.	Stroke.	Capacity per Revolution.	Revolution per Minute.	Suction and Discharge.	* Lift and Force.	Cipher.	Price.
1 Horse Power	6 in.	4 in.	1.47 gals.	35 to 50	3 in. pipe.	20 ft.	Neism	\$205.00
2 " "	6 " "	6 " "	2.20 " "	35 to 50	3 " "	30 " "	Wetshod	230.00

Air Chamber with Tee for 3 in. pipe, extra . . . \$7.50

2 in. Wrought-Iron Tumbling Shaft, per foot, extra . . . \$0.75

\* Total lift and force from water to point of discharge.

## GOULDS STRONG PONY OR ONE-HORSE POWER.

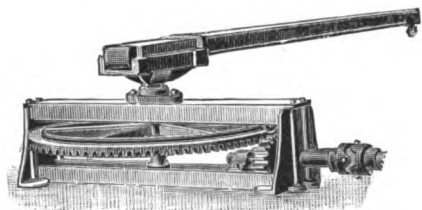


FIG. 597.

The cut shows a very simple though thoroughly constructed One-Horse or Pony Gear for operating any kind of agricultural machinery, as feed cutters, corn mills, etc. We furnish it complete, as shown in cut, with universal joint and stub end to weld to horizontal shaft, and hard-wood pole ten feet long. The animal will ordinarily make from three to four circuits per minute, giving the tumbling shaft a speed of 20 to 25 revolutions.

FIG. 597. SIZE, PRICE, ETC.

Diameter Large Gear.	No. Teeth.	Diameter Pinion.	No. Teeth.	Size Frame.	Cipher.	Price.
31 in.	91	4 1/4 in.	14	38 x 12 in., 10 in. high.	Miry	\$55.00

## GOULDS HORSE GEAR PUMPING APPARATUS.

FOR ONE HORSE.

Fig. 884 consists of Horse Gear amply strong for one horse; two-throw wrought-iron crank-shaft, plummer blocks for mounting on timbers placed on top of well, slings, guides and rods for connecting to Fig. 527 1/2 Double Barrel Pump, page 113.

The apparatus is very simple, requires but little attention. In this outfit it is intended that animal shall track outside of well. From three to four circuits a minute are ordinarily made, giving the tumbling shaft a speed of 20 to 25 revolutions per minute. We give prices below and also upon extra tumbling shaft, plummer blocks and universal coupling. Arranged in this manner animal tracks between well and gear. A track with radius of 10 feet is recommended.

FIG. 884. SIZES, PRICES, ETC.

One-Horse Gear . .	Stroke.	Geared.	* Will Operate.	Cipher.	Price.
	10 in.	6 to 1	{ 2 1/2 in. Double Cyl. 85 ft. } 3 55 "	Wayfare	\$110.00

Hardwood Pole, extra

2-inch Tumbling Shaft, per foot

\$3.00

.75

Universal Coupling . . . . .

Plummer Blocks . . . . .

\$10.00

3.00

\* Referring to Fig. 527 1/2 Double Barrel Pump, page 113. Smaller cylinders in proportionately deeper or larger cylinders in shallower wells.

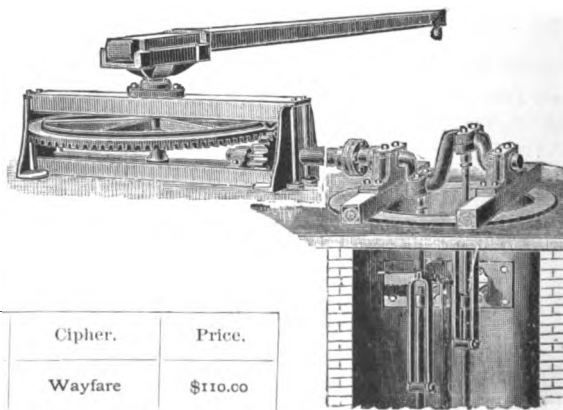


FIG. 884.



# GOULDS IRON HORSE POWER.

FOR ONE OR TWO HORSES.

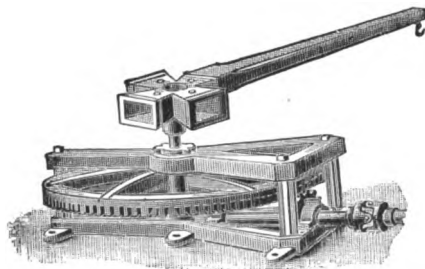


FIG. 597 1-2.

FIG. 597 1-2. SIZE, PRICE, ETC.

Diameter Large Gear.	No. Teeth.	Diameter Pinion.	No. Teeth.	Size Frame.	Cipher.	Price.
38½ in.	97	6½ in.	16	48 x 32 in. 13 in. high.	Missed	\$120.00

When pole is not furnished a reasonable reduction will be made.

# GOULDS HORSE GEAR PUMPING APPARATUS.

FOR TWO HORSES.

Fig. 885, Horse Gear Pumping Apparatus, is practically the same as our Fig. 884 described on opposite page, but about twice as heavy and powerful and designed to be operated by two horses. It is furnished complete with wrought-iron crank shaft, plunger blocks for mounting on timbers placed on top of well, slings, guides and rods for connecting to Double Barrel Pump below. For Pump suitable for this gear, we recommend Fig. 527 1-2 (page 113). Animals usually make from three to four circuits per minute, giving tumbling shaft a speed of 20 to 25 revolutions. If it is desired that animals shall track inside the well, we furnish extra long tumbling shaft, etc., as quoted below.

FIG. 885. SIZE, PRICE, ETC.

	Stroke.	Geared.	* Will Operate.	Cipher.	Price.
Two-Horse Gear.	10 in.	6 to 1	{ 3½ Double Cyl., 80 ft. 6 " " " 30 "	Wayfet	\$160.00

Hardwood Pole, extra . . . . \$3.00 Universal Coupling . . . . \$10.00  
2-inch Tumbling Shaft, per foot . . . . .75 Plunger Blocks . . . . .3.00

\* Smaller Cylinders in proportionately deeper, and larger Cylinders in shallower wells.

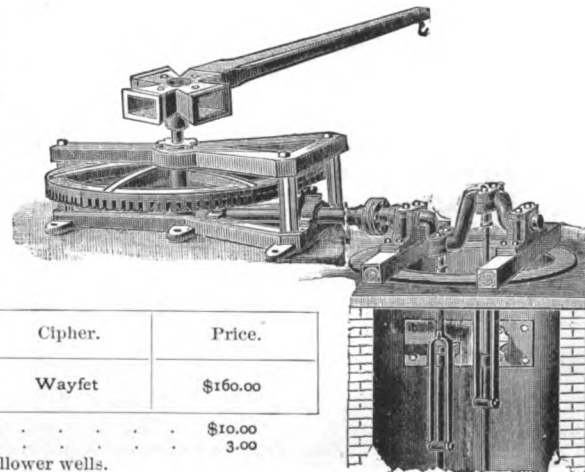


FIG. 885.

# GOULDS HORSE GEAR PUMPING APPARATUS.

FOR ONE OR TWO HORSES.

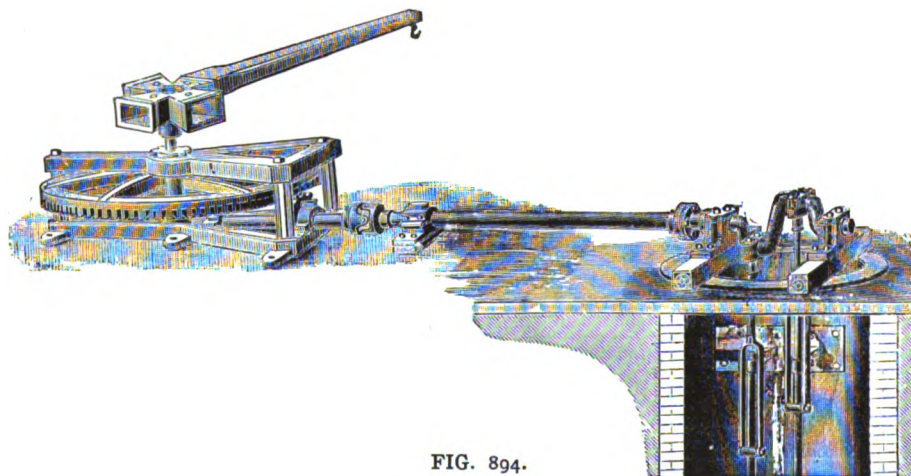


FIG. 894.

This consists of Horse Gear amply strong for two horses; 10 feet of shafting with plummer blocks and couplings, two-throw wrought-iron crank shaft, plummer blocks for mounting on timbers placed on top of well, slings, guides and rods for connecting to pump rods below. The apparatus is very simple, requires but little attention and will work satisfactorily. A track with radius of 10 feet is recommended, the animal tracking between well and gear with this outfit. An animal makes three to four circuits per minute, giving tumbling shaft a speed of 20 to 25 revolutions. Power of donkey or pony one-half that of horse. We recommend our Fig. 527 1-2 (given on page 113) for use with this horse gear.

FIG. 894. SIZES, PRICES, ETC.

	Stroke.	Geared.	* Will Operate.	Cipher.	Price.
One Horse Gear . .	10 in.	6 to 1	{ 2½ in. Double Cylinder, 85 ft. }	Bondmaid	\$120.00
Two " " . .	10 "	6 to 1	{ 3 " " " 55 " }	Bondman	170.00
			{ 3½ " " " 80 " }		
			{ 6 " " " 30 " }		

\* Smaller Cylinders in proportionately deeper, and larger Cylinders in shallower wells.

# GOULDS SINGLE BARREL PUMP.

FOR DEEP WELLS.

Fig. 526 1-2 represents our Single Barrel Deep Well Pump with air chamber in iron or with brass cylinders, as ordered, with doors at top and bottom allowing free access to all valves. This Pump may be operated by any of our Pumping Apparatuses (pages 53 to 55), or with our Horse Gears with single-throw crank, Figs. 884, 885 and 894 (pages 110 to 112). A check or foot valve should be placed at extremity of suction pipe. We fit with harp connection and stub for welding to connecting rod.

FIG. 526 1-2. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per stroke.	Suc. and Dis.	* Lift and Force.	Well Rod.	IRON BARREL.		BRASS BARREL.	
						Cipher.	Price.	Cipher.	Price.
2½ in.	10 in.	.21 gal.	1½ in. pipe.	200 ft.	7⁄8 in.	Jawad	\$42.00	Jibbo	\$44.50
3 "	10 "	.31 "	1½ "	200 "	7⁄8 "	Jayel	44.00	Jigar	49.50
3½ "	10 "	.42 "	2 "	150 "	7⁄8 "	Jeerba	49.50	Jobba	57.00
4 "	10 "	.54 "	2 "	150 "	7⁄8 "	Jerko	62.00	Jog	71.00
5 "	10 "	.85 "	2½ "	100 "	7⁄8 "	Jestlu	84.50	John	103.00
6 "	10 "	1.22 "	3 "	100 "	7⁄8 "	Jetam	101.25	Join	129.00

\* Total lift and force from water to point of discharge, Pump not more than 25 feet above water.



FIG. 526 1-2.

# GOULDS DOUBLE BARREL PUMP.

FOR DEEP WELLS.

Fig. 527 1-2 represents our superior Double Barrel Deep Well Pump in iron or with brass cylinders, as ordered, with doors at top and bottom for access to all valves.

They are also built with brass stuffing boxes, buckets, rods, etc., and fitted for welding connecting rods to stub with bow, as shown in cut, or pin and socket stub as preferred. These Double Barrel Pumps are specially designed to be operated by our Horse Gears and Well Frames (pages 110 to 112) for irrigating service, etc.

Pumps may be worked at 30 to 40 revolutions per minute according to depth of well.

FIG. 527 1-2. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Rev.	Suc. and Dis.	* Lift and Force.	Well Rod.	IRON BARRELS.		BRASS BARRELS.	
						Cipher.	Price.	Cipher.	Price.
2½ in.	10 in.	.42 gal.	1½ in. pipe.	200 ft.	7⁄8 in.	Joke	\$58.00	July	\$71.00
3 "	10 "	.60 "	2 "	200 "	7⁄8 "	Jolt	64.00	Jump	81.00
3½ "	10 "	.84 "	2½ "	150 "	7⁄8 "	Jots	74.00	June	93.00
4 "	10 "	1.08 "	2½ "	150 "	7⁄8 "	Joves	85.00	Junks	108.00
5 "	10 "	1.70 "	3 "	100 "	7⁄8 "	Joy	120.00	Jury	175.00
6 "	10 "	2.44 "	3½ "	100 "	7⁄8 "	Jug	160.00	Just	235.00

\* Total lift and force from water to point of discharge, Pump not more than 25 feet above water.

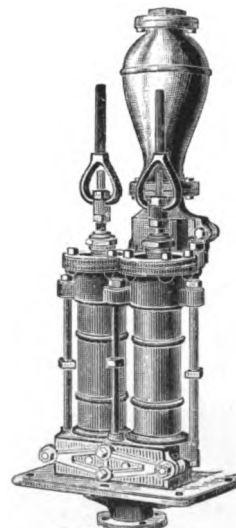
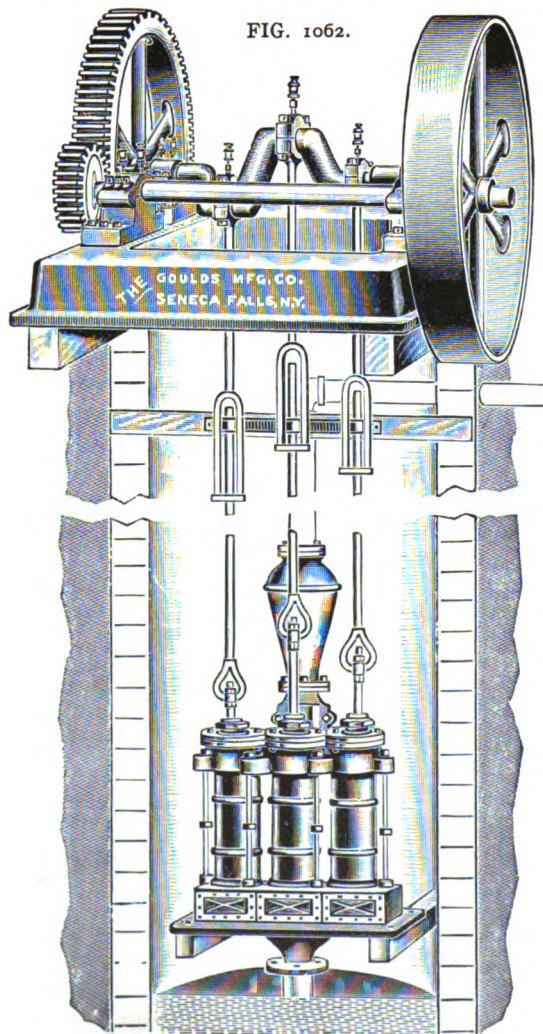


FIG. 527 1-2.

# GEARED DRIVING SHAFT AND TREBLE BARREL PUMP.

FIG. 1062.



# GEARED DRIVING SHAFT AND TREBLE BARREL PUMP.

FOR DEEP WELLS.

Under **Fig. 1062**, we illustrate on opposite page our Geared Driving Shaft and Treble Barrel Pump for deep wells. Driving Shaft is mounted on heavy cast-iron frame to which the pillow blocks of the main and pinion shafts are bolted. The crank shaft is of cast-steel in one piece, after our well known Triplex pattern.

We furnish complete with forged connecting rods, having phosphor-bronze lined boxes and caps, pitmans, guide rods and guides. We do not include connecting rod or discharge pipe between Driving Shaft and Pump. We refer to pages 91 and 309 for these supplies.

Treble Barrel Pump is built with iron or brass cylinders as ordered. These cylinders are securely tied to iron top and bottom chambers by stay rods, and can be easily removed and replaced, as necessary. Doors are provided at top and bottom, affording access to all valves. Both styles of Pumps have brass plungers, plunger rods and stuffing boxes, and are fitted for welding connecting rods to stub with bow, as shown in cut, or pin and socket stub, if so ordered.

This pumping apparatus may be operated by any motive power, as water wheel, steam, oil or gas engine, or equally well, electric motor, and is specially adapted for pumping large quantities of water from deep wells for irrigation, city water supply, etc,

We solicit correspondence on this head.

**FIG. 1062. SIZES, PRICES, ETC.**

Diameter and Stroke Barrels.	Will operate in Wells.	Capacity per Stroke.	Proper Speed and Capacity per Minute.	PIPES.		IRON BARRELS.		BRASS BARRELS.	
				Dis.	Suc.	Cipher.	* Price.	Cipher.	* Price.
5 x 8 in.	300 ft.	2.04 gal.	35 strokes — 71.40 gal.	3 in.	3 in.	Elbem		Elliac	
6½ x 8 "	300 "	3.45 "	35 " — 120.75 "	3½ "	4 "	Elbend		Elliby	
8 x 8 "	300 "	5.22 "	35 " — 182.70 "	4 "	5 "	Elbeox		Ellicu	
8 x 10 "	300 "	6.53 "	35 " — 228.55 "	4 "	5 "	Elbida		Ellido	
9 x 10 "	300 "	8.26 "	35 " — 289.10 "	6 "	6 "	Elbigo		Ellify	
10 x 12 "	300 "	12.24 "	35 " — 428.40 "	6 "	8 "	Elbort		Elligci	
11 x 12 "	300 "	14.81 "	35 " — 518.35 "	6 "	8 "	Elboam		Ellihoe	
12 x 12 "	250 "	17.63 "	35 " — 617.05 "	8 "	8 "	Elbuck		Ellijac	

\* Prices upon application.

# GOULDS WELL FRAME AND DOUBLE BARREL PUMP.

FOR MANUAL POWER.

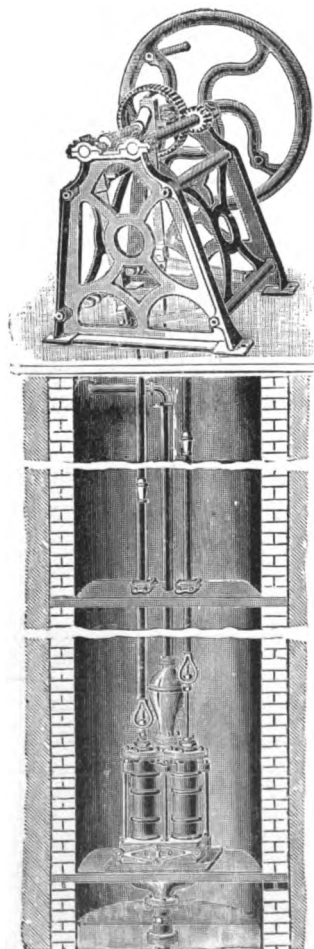


FIG. 718

Fig. 718 represents our Triangular Well Frame Fig. 545, and Double Barrel Pump Fig. 527½, arranged for well pumping by manual power. Pump should be levelled and held firmly to coping or planks laid across the well. Roller guides should be stationed every 12 feet for rods to work through, and suction pipe should have check valve on end. We furnish this pumping apparatus complete, except wrought-iron connecting pipes, rods, guides, couplings, check valve, etc., which will be found listed on pages 91 and 309, and are extra, according to depth of well.

Our table will give full information.

FIG. 718. SIZES, PRICES, ETC.

Dia. Cyls.	Stroke.	Capacity per Revolution.	Suction.	Discharge.	* Lift and Force.	IRON CYLINDERS.	
						Cipher.	Price.
2½ in.	10 in.	.43 gal.	1½ in. pipe.	1½ in. pipe.	50 ft.	Tocka	\$139.50
3 "	10 "	.61 "	2 "	2 "	40 "	Tocsin	145.50
3½ "	10 "	.83 "	2½ "	2½ "	30 "	Tactat	155.50
4 "	10 "	1.09 "	2½ "	2½ "	20 "	Today	166.50

\* Total lift and force from supply to delivery, Pump not more than 20 feet above water.

# GOULDS HORSE GEAR AND DOUBLE BARREL PUMP.

FOR HORSE POWER.

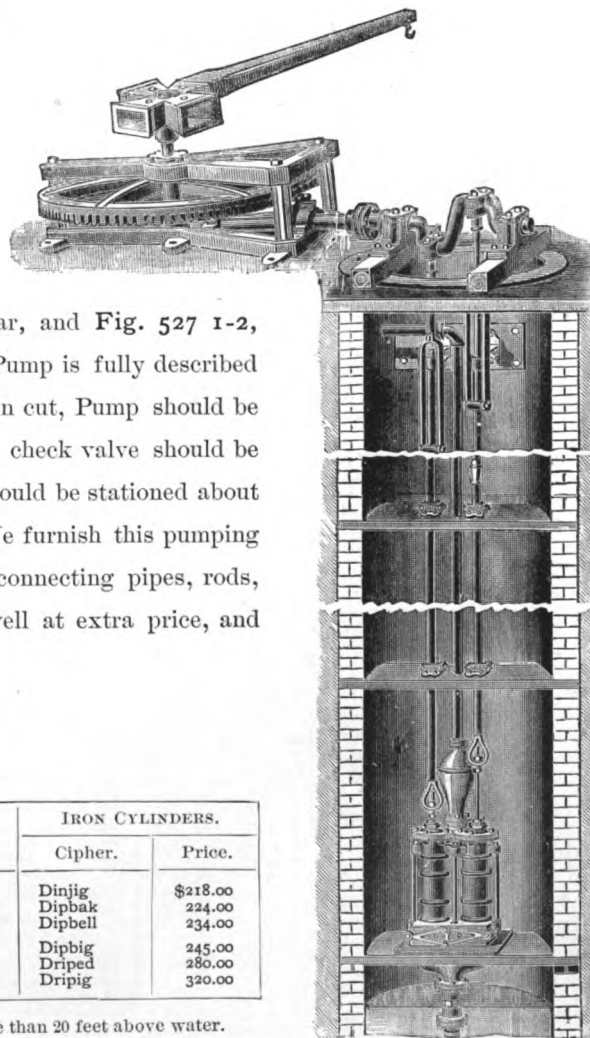


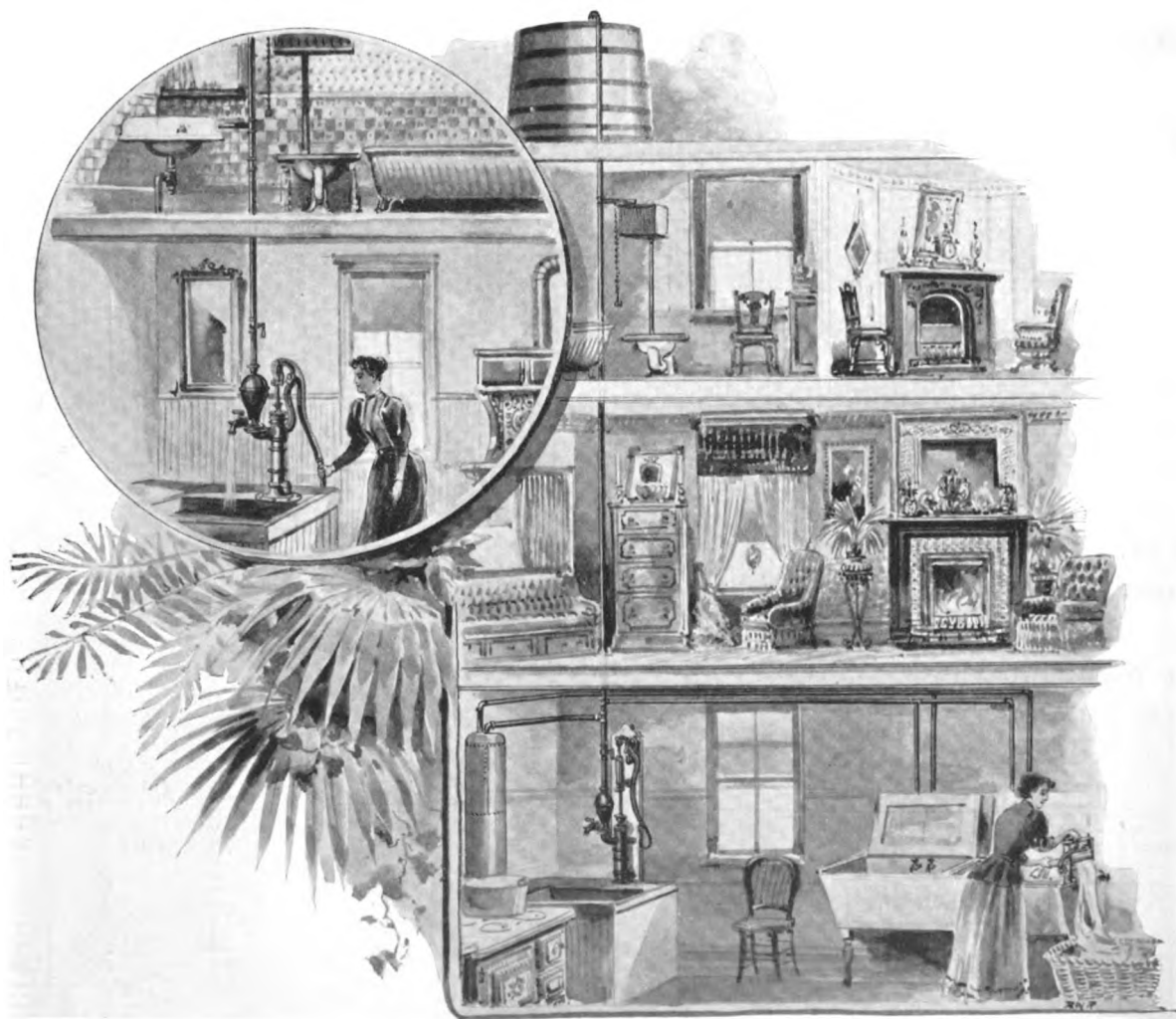
Fig. 720 represents Fig. 885, our Two-Horse Gear, and Fig. 527 1-2, Double Barrel Pump, arranged for well pumping. The Pump is fully described on page 113; Horse Gear on page 111. As illustrated in cut, Pump should be attached to coping or planks laid across the well and a check valve should be placed in the extremity of suction pipe. Roller guides should be stationed about every 12 feet on stages for the rods to work through. We furnish this pumping apparatus complete with the exception of wrought-iron connecting pipes, rods, guides, etc. These we supply according to depth of well at extra price, and will be found listed on pages 91 and 309.

Our table gives full information.

FIG. 720. SIZES, PRICES, ETC.

Dia. Cyls.	Stroke.	Capacity per Revolution.	Suction.	Discharge.	* Lift and Force.	IRON CYLINDERS.	
						Cipher.	Price.
2½ in.	10 in.	.43 gals.	1½ in. pipe.	1½ in. pipe.	150 ft.	Dinjig	\$218.00
3 "	10 "	.61 "	2 "	2 "	110 "	Dipbak	224.00
3½ "	10 "	.83 "	2½ "	2½ "	80 "	Dipbell	234.00
4 "	10 "	1.09 "	2½ "	2½ "	60 "	Dipbig	245.00
5 "	10 "	1.70 "	3 "	3 "	40 "	Driped	280.00
6 "	10 "	2.45 "	3½ "	3½ "	26 "	Dripig	320.00

\* Total lift and force from supply to point of delivery, Pump not more than 20 feet above water.



See pages 119 to 135 for more complete description of these Pumps as built for manual and power use.



# GOULDS HOUSE FORCE PUMP.

WITH REVOLVING BRAKE AND CHECK VALVE.

Fig. 390 represents our Hand Force Pump on base with upper check valve discharge and brass cased piston rod with links working through brass gland.

We make this style of Pump of iron, or cylinder and piston of brass, or all brass except the lever, fulcrum and base, as per table given below.

Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 390. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS CYL.		BRASS.	
							Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 in. pipe.	60 ft.	Child	\$8.00	Cart	\$13.50	Carve	\$20.00
2	2½ "	6 "	.13 "	1¼ "	1¼ "	60 "	Chind	9.50	Drum	14.00	Drund	21.00
4	3 "	6 "	.18 "	1½ "	1½ "	60 "	Cited	11.00	Dry	15.00	Dryad	32.00
6	3½ "	7½ "	.31 "	1½ "	1½ "	40 "	Curdy	17.00	Cured	24.00	Curer	38.00
8	4 "	7½ "	.41 "	2 "	1½ "	40 "	Cure	18.00	Curfue	30.00	Curious	47.00

\* Total lift and force from water to point of delivery, Pump not more than 25 feet above water.

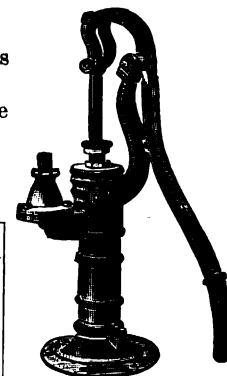


FIG. 390.

# GOULDS HOUSE FORCE PUMP.

WITH REVOLVING BRAKE AND CHECK VALVE.

Fig. 391 represents our Hand Force Pump on plank, with upper check valve discharge and brass cased piston rod with links working through brass gland.

We make this style of Pump of iron, or with cylinder and piston of brass, or entirely of brass except the lever and fulcrum, as per table given below.

Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 391. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS CYL.		BRASS.	
							Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 in. pipe.	60 ft.	Chime	\$8.00	Case	\$13.50	Chair	\$20.00
2	2½ "	6 "	.13 "	1¼ "	1¼ "	60 "	Chippy	9.50	Ducat	14.00	Ducal	21.00
4	3 "	6 "	.18 "	1½ "	1½ "	60 "	City	11.00	Duchy	15.00	Duchess	32.00
6	3½ "	7½ "	.31 "	1½ "	1½ "	40 "	Curly	17.00	Current	24.00	Curried	38.00
8	4 "	7½ "	.41 "	2 "	1½ "	40 "	Curly	18.00	Currier	30.00	Curry	47.00

\* Total lift and force from water to point of discharge, Pump not more than 25 feet above water.

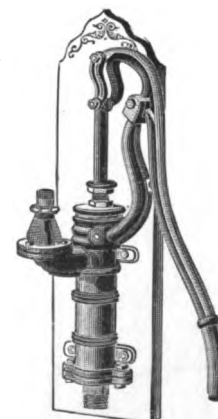


FIG. 391.

# GOULDS HOUSE FORCE PUMP.

WITH REVOLVING BRAKE AND AIR CHAMBER.



FIG. 392.

Fig. 392 represents our Hand Force Pump on base, having upward discharge air chamber and brass cased rod with links working through brass gland. We make this style of Pump of iron, or with cylinder and piston of brass, except lever, fulcrum and air chamber, as per table given below. Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 392. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 in. pipe.	Carviol	\$8.50	Carvkog	\$13.50	Carvilit	\$20.50
2	2½ "	6 "	.13 "	1½ "	1½ "	Chirp	10.00	Duck	15.00	Ducked	22.00
4	3 "	6 "	.18 "	1½ "	1½ "	Cavil	12.00	Due	16.00	Ductyl	33.00
6	3½ "	7½ "	.31 "	1½ "	1½ "	Vacancy	18.00	Vacate	26.00	Vacatin	40.00
8	4 "	7½ "	.41 "	2 "	1½ "	Vacant	20.00	Vacatid	32.00	Vacatio	49.00

# GOULDS HOUSE FORCE PUMP.

WITH REVOLVING BRAKE AND AIR CHAMBER.



FIG. 393.

Fig. 393 represents our Hand Force Pump on plank, having upward discharge air chamber and brass cased rod with links working through brass gland. We make this style of Pump of iron, or with cylinder and piston of brass, or entirely of brass, except lever, fulcrum and air chamber, as per table given below. Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 393. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 in. pipe.	Carvman	\$8.50	Buoma	\$14.00	Buplar	\$20.50
2	2½ "	6 "	.13 "	1½ "	1½ "	Chop	10.00	Dual	15.00	Duber	22.00
4	3 "	6 "	.18 "	1½ "	1½ "	Claim	12.00	Duel	16.00	Dubious	33.00
6	3½ "	7½ "	.31 "	1½ "	1½ "	Vaccary	18.00	Vacuate	26.00	Vacuist	40.00
8	4 "	7½ "	.41 "	2 "	1½ "	Vaccine	20.00	Vacuaso	32.00	Vacuity	49.00

# GOULDS HOUSE FORCE PUMP.

WITH REVOLVING BRAKE, AIR CHAMBER AND COCK SPOUT.

Fig. 394 represents our Hand Force Pump on base with double discharge air chamber and cock. By closing cock the discharge may be made from top of air chamber.

We make this style of Pump of iron, or with cylinder and piston of brass, or entirely of brass, except lever, fulcrum, base and air chamber.

Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 394. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 1/4 in. pipe and 1 in. hose.	Diggub	\$11.00	Digha	\$16.50	Dighale	\$22.00
2	2 1/2 "	6 "	.13 "	1 1/4 "	1 1/4 " " 1 "	Drone	12.50	Duger	18.00	Dulcet	23.50
4	3 "	6 "	.18 "	1 1/4 "	1 1/4 " " 1 "	Dross	14.50	Duke	19.50	Dulcify	35.00
6	3 1/2 "	7 1/2 "	.31 "	1 1/2 "	1 1/2 " " 1 "	Cut	21.50	Cutlas	29.50	Cutler	43.50
8	4 "	7 1/2 "	.41 "	2 "	1 1/2 " " 1 "	Cycle	22.50	Cygnat	35.50	Cymbal	52.00



FIG. 394.

# GOULDS HOUSE FORCE PUMP.

WITH REVOLVING BRAKE, AIR CHAMBER AND COCK SPOUT.

Fig. 395 represents our Hand Force Pump on plank, with double discharge, air chamber and cock spout. Closing cock turns discharge through top of air chamber.

We make this style of Pump of iron, or with cylinder and piston of brass, or entirely of brass, except the lever, fulcrum and air chamber.

Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 395. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 1/4 in. pipe and 1 in. hose.	Dighim	\$11.00	Dighot	\$16.50	Dighunt	\$22.00
2	2 1/2 "	6 "	.13 "	1 1/4 "	1 1/4 " " 1 "	Drop	12.50	Duly	18.00	Dumpel	25.50
4	3 "	6 "	.18 "	1 1/4 "	1 1/4 " " 1 "	Drove	14.50	Dumb	19.50	Dumpy	35.00
6	3 1/2 "	7 1/2 "	.31 "	1 1/2 "	1 1/2 " " 1 "	Curt	21.50	Curtail	29.50	Curtainy	42.50
8	4 "	7 1/2 "	.41 "	2 "	1 1/2 " " 1 "	Curve	22.50	Curved	35.50	Curvety	52.50



FIG. 395.

# GOULDS HOUSE FORCE PUMP.

WITH REVOLVING BRAKE AND DOUBLE DISCHARGE AIR CHAMBER.



FIG. 398.

Fig. 398 represents our Hand Force Pump on base, with horizontal discharge air chamber. The brass cased piston rod, with links, works through brass gland.

We make this style of Pump of iron, or with cylinder and piston of brass, or entirely of brass, except lever, fulcrum, base and air chamber, as per table given below.

Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 398. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 in. hose.	Dighyer	\$8.50	Dinhus	\$13.50	Dinhyt	\$20.50
2	2½ "	6 "	.13 "	1½ "	1 "	Chuck	10.00	Dunac	15.00	Dungeon	22.00
4	3 "	6 "	.18 "	1½ "	1 "	Clamy	12.00	Dunce	16.00	Dunned	33.00
6	3½ "	7½ "	.31 "	1½ "	1 "	Vagous	18.00	Vagrant	25.00	Vail	40.00
8	4 "	7½ "	.41 "	2 "	1 "	Vagrancy	21.00	Vague	32.00	Vailed	49.00

# GOULDS HOUSE FORCE PUMP.

WITH REVOLVING BRAKE AND DOUBLE DISCHARGE AIR CHAMBER.

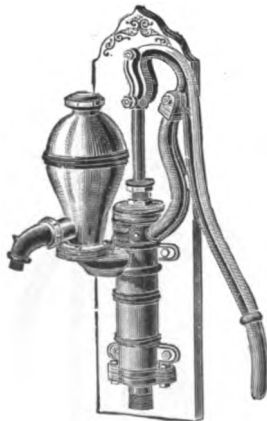


FIG. 399.

Fig. 399 represents our Hand Force Pump on plank, with horizontal discharge air chamber. Brass cased piston rod works through brass gland.

We make this style of Pump of iron, or with cylinder and piston of brass, or entirely of brass, except the lever, fulcrum and air chamber, as per table given below.

Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 399. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	IRON.		BRASS CYL.		BRASS.	
						Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 in. hose.	Dinib	\$8.50	Dinite	\$13.50	Dinisk	\$20.50
2	2½ "	6 "	.13 "	1½ "	1 "	Churn	10.00	Dupe	15.00	Duskly	22.00
4	3 "	6 "	.18 "	1½ "	1 "	Clamper	12.00	Dusk	16.00	Duskiah	33.00
6	3½ "	7½ "	.31 "	1½ "	1 "	Vallars	18.00	Vain	25.00	Vairy	40.00
8	4 "	7½ "	.41 "	2 "	1 "	Vailing	21.00	Vainly	32.00	Valet	49.00

# GOULDS "ALLABOUT" HOUSE FORCE PUMP.

WITH REVOLVING BEARER TOP AND CUT-OFF BASE.

Our new "Allabout" Suction and Force Pumps combine in one Pump some of the features and advantages of our Cistern Pumps, Pitcher Spout Pumps and Force Pumps for house service, etc. The revolving bearer top may be brought into any position, the cut-off base separated for making or breaking pipe connections, and discharge taken either through spout or piped from back opening by removing plug in sight. Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 953. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	IRON.		BRASS LINED.	
						Cipher.	Price.	Cipher.	Price.
2 4	2½ in. 3 "	2½ in. 2½ "	.05 gal. .08 "	1½ in. pipe. 1¼ "	1 in. pipe and 1 in. hose.	Woosy Woos	\$6.00 7.00	Jangle Jarring	\$7.00 8.00

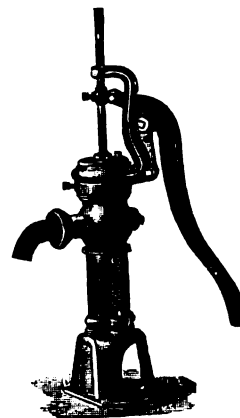


FIG. 953.

# GOULDS "ALLABOUT" HOUSE FORCE PUMP.

WITH REVOLVING BEARER TOP AND COCK SPOUT.

Fig. 954 is same in general design and construction as Fig. 953, described above, except that it has a cock in spout. By this arrangement water can be distributed in two or more directions by making a connection to the opening at back of the spout. Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 954. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	IRON.		BRASS LINED.	
						Cipher.	Price.	Cipher.	Price.
2 4	2½ in. 3 "	2½ in. 2½ "	.05 gal. .08 "	1½ in. pipe. 1¼ "	1 in. pipe and 1 in. hose.	Nonesuh Nonius	\$8.50 9.50	Nonslid Nonslob	\$9.50 10.50

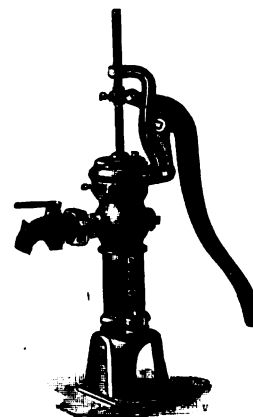


FIG. 954.

## GOULDS "ALLABOUT" HOUSE FORCE PUMP.

WITH REVOLVING BEARER TOP, AIR CHAMBER AND CUT-OFF BASE.

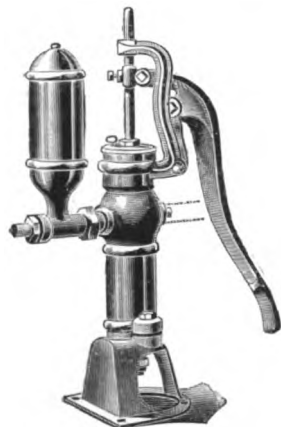


FIG. 973.

Fig. 973 is same in general design and construction as Fig. 953, described on preceding page, except that it has additional air chamber capacity, adapting it for somewhat higher pressure service, including spraying trees and kindred duties. Pump cylinder may be emptied of water by raising lever and tripping valve.

FIG. 973. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS LINED.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	2½ in.	.05 gal.	1½ in. pipe.	1 in. pipe and ¾ in. hose.	75 ft.	Twibil	\$8.50	Jetted	\$9.50
4	3 " "	2½ " "	.08 " "	1½ " " "	1 " " ¾ " "	50 " "	Twiced	9.50	Keeled	10.50

\* Total lift and force from water to point of delivery, Pump not more than 25 feet above water.

## GOULDS DOUBLE-ACTING HOUSE FORCE PUMP.

WITH CRANK SHAFT AND FLY-WHEEL.

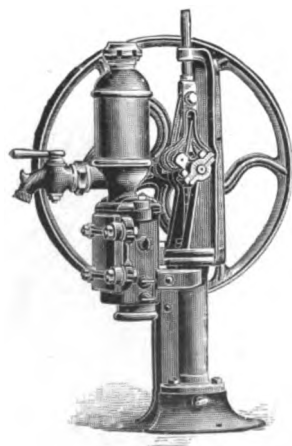


FIG. 938.

The Pump represented herewith is but a modification of our new style "Pacific" Double-Acting Suction and Force Pump, arranged with crank shaft and fly-wheel. Cock in spout permits discharge to be made from top of air chamber to tank above or wherever desired.

The Valves, of a new and improved style, are all grouped in valve box in front and easy of access.

Plugs are provided for emptying Pump of water in cold weather.

FIG. 938. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS LINED.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	2½ in.	.10 gal.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	60 ft.	Whaler	\$33.00	Whall	\$38.00
4	3½ " "	2½ " "	.16 " "	1½ " " "	1½ " " 1 " "	40 " "	Whaling	38.00	Whane	43.00

\* Total lift and force from water to point of delivery, Pump not more than 25 feet above water.

# GOULDS HOUSE FORCE PUMP.

WITH CRANK SHAFT AND FLY-WHEEL.

**Fig. 898** represents a Suction and Force Pump arranged with crank shaft and fly-wheel.

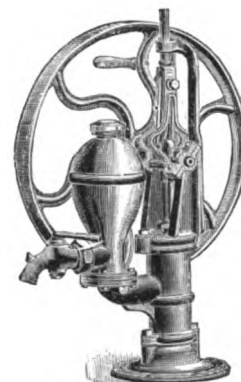
Recognizing the fact that lever pumps are rarely, if ever, worked to their full length of stroke and that this manner of operating entails considerable lost motion, we have been enabled to shorten the pump cylinder and yet to obtain the same results as from a longer stroke lever Pump operated in the usual manner.

The addition of cock in air chamber permits water being discharged at point of operation as well as at any distance removed.

**FIG. 898. SIZES, PRICES, ETC.**

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	IRON.		BRASS CYL.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	2½ in.	.05 gals.	1¼ in. pipe.	1¼ in. pipe and 1 in. hose.	Weed	\$20.50	Zutemoc	\$30.50
4	3 in.	2½ in.	.08 "	1¼ in. "	1¼ in. "	Weeder	22.50	Zutemud	35.00

\* Total lift and force from supply to point of delivery, Pump not more than 20 feet above water.



**FIG. 898.**

# GOULDS HOUSE FORCE PUMP.

WITH CRANK SHAFT AND FLY-WHEEL.

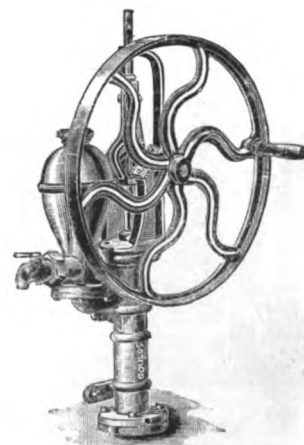
**Fig. 899** represents our Suction and Force Pump with crank shaft and fly-wheel. This Pump is practically the same as **Fig. 898** shown above, except that it is arranged with brackets for attaching to side wall instead of base for screwing to floor.

Our table will afford full information as to sizes, capacities, etc.

**FIG. 899. SIZES, PRICES, ETC.**

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharges.	IRON.		BRASS CYL.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	2½ in.	.05 gal.	1¼ in. pipe.	1¼ in. pipe and 1 in. hose.	Dabba	\$20.50	Dashad	\$30.50
4	3 in.	2½ in.	.08 "	1¼ in. "	1¼ in. "	Dabber	22.50	Demite	35.00

\* Total lift and force from supply to point of delivery, Pump not more than 20 feet above water.



**FIG. 899.**

## BRASS HOUSE FORCE PUMPS.

ON IRON FRAMES, WITH REVOLVING LEVERS.

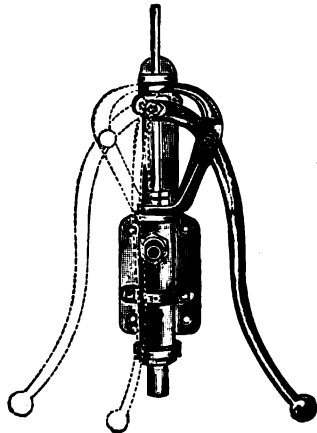


FIG. 1044.

Fig. 1044 represents our new Brass Force Pump on iron frame, with revolving lever. This lever may be moved at will to any position most convenient to operate the pump. This change of position of lever involves no removing of nuts and bolts, but is as easily effected as the pump is operated.

Fig. 1054 represents same pump with air chamber.

Where head of water works will not force water above first stories, these Pumps will be fully appreciated. Pumps are small, compact and require but little space for their accommodation.

We can fit both suction and discharge for either hose or wrought-iron pipe, if so ordered, but regularly fit as given in our table below.

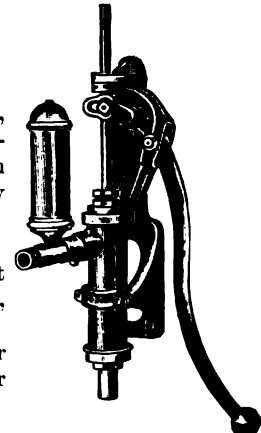


FIG. 1054.

### SIZES, PRICES, ETC.

Fig.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	Cipher.	Price.
1044	1 13-16 in.	3 1/2 in.	.04 gal.	1 in. lead pipe.	3/4 in. lead pipe.	50 ft.	Basaltic Acocko	\$10.00
1054	1 13-16 "	3 1/2 "	.04 "	1 " "	3/4 in. hose.	75 "		14.00

\* Total lift and force from supply to point of delivery, Pump not to be more than 25 feet above water.



FIG. 927.

## ALL BRASS NICKELED BASIN PUMP.

WITH BOLTS FOR SLAB.

Fig. 927 is an all brass nickel-plated Suction and Lift Pump, especially designed for railroad cars, yachts, steamers, city or country residences, or any place where compactness and utility are first requisites. All parts are highly finished and in keeping with the best appointed apartments.

### FIG. 927. SIZE, PRICE, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction Fitted for	Lift.	Cipher.	Price.
3 in.	1 1/2 in.	.04 gal.	1 in. pipe.	20 ft.	Weltej	\$14.00



# GOULDS HOUSE FORCE PUMPS.

MOUNTED ON PLANK, RIGHT OR LEFT HANDED.

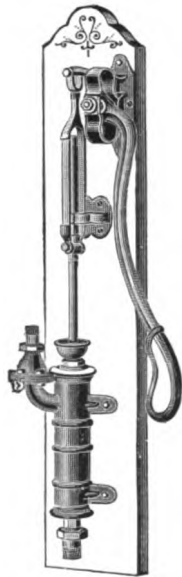


FIG. 440.

Fig. 440 represents our Single-Acting Suction and Force Pump, with brass-cased plunger rod, pitman and guide, mounted on plank, for indoor use, and can be made either right or left handed.

It is generally employed for lifting water from wells or cisterns and forcing it up into more elevated parts of the house for bath-rooms, tanks, etc. Plumbers wishing to attach copper air chambers usually select this style. The check valve can be removed and air chamber substituted without extra fitting.

Fig. 441 represents the same Pump with the addition of an air chamber which insures a continuous stream of water and relieves the pipe from the concussion of the water.

The Iron and Brass Cylinder Pumps are fitted for iron pipe and the brass pumps for lead pipe, unless otherwise ordered.

Double discharge air chamber supplied at same price, or brass air chambers made to order at difference in cost of material.



FIG. 441.

FIG. 440. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS CYLINDER.		BRASS.	
							Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.09 gal.	1 in. pipe.	1 in. pipe.	80 ft.	Flit	\$14.00	Dyer	\$19.00	Dwarf	\$26.00
2	2 1/2 "	7 "	.15 "	1 1/4 "	1 1/4 "	60 "	Float	15.00	Eacher	20.00	Dwell	30.00
3	2 3/4 "	7 "	.18 "	1 1/4 "	1 1/4 "	60 "	Flock	15.75	Eady	21.00	Dwine	33.00
4	3 "	7 "	.21 "	1 1/4 "	1 1/4 "	60 "	Flog	16.50	Eager	22.00	Dyed	35.00
5	3 1/2 "	7 "	.25 "	1 1/2 "	1 1/2 "	40 "	Flopa	20.00	Eagerly	25.00	Dyke	40.00
6	3 1/2 "	7 "	.29 "	1 1/2 "	1 1/2 "	40 "	Flora	22.00	Earing	32.00	Dull	45.00

FIG. 441. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS CYLINDER.		BRASS.	
							Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.09 gal.	1 in. pipe.	1 in. pipe.	100 ft.	Floss	\$16.00	Earn	\$22.00	Eagle	\$28.00
2	2 1/2 "	7 "	.15 "	1 1/4 "	1 1/4 "	75 "	Flour	17.00	Earth	23.00	Ear	32.00
3	2 3/4 "	7 "	.18 "	1 1/4 "	1 1/4 "	75 "	Flout	17.75	Earwig	24.00	Easter	35.00
4	3 "	7 "	.21 "	1 1/4 "	1 1/4 "	75 "	Flow	18.50	Ease	25.00	Early	37.00
5	3 1/2 "	7 "	.25 "	1 1/2 "	1 1/2 "	50 "	Flown	23.00	Easel	28.00	Easting	43.00
6	3 1/2 "	7 "	.29 "	1 1/2 "	1 1/2 "	50 "	Fluid	25.00	Easily	35.00	Flail	50.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

# GOULDS HOUSE FORCE PUMPS.

FOR MANUAL OR MACHINE POWER.

Fig. 442 represents our House Force Pump with air chamber and cock through which water can be drawn at pump. This cock spout can be exchanged for brass tube cut for iron pipe where double discharge of this kind is required.

Fig. 281 represents a House Force Pump adapted for deep wells or any place where it is desired to operate Pump at some distance above water. The following should be observed in placing these Pumps: At, say, 15 or 20 feet from the bottom of well secure Pump to a timber or plank. At convenient height above locate lever and spout air chamber. Connect the air chamber above with the one below by pipe. Join the stub end attached to the lever to the stub end of the Pump.

When ordered without spout air chamber, a deduction of \$1.00 in list will be made.

Iron and Brass Cylinder Pumps are fitted for wrought-iron pipe and Brass Pumps for lead pipe, unless otherwise ordered.

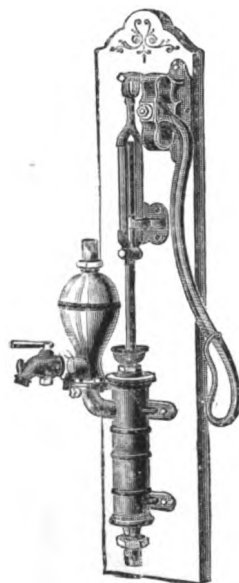


FIG. 442.

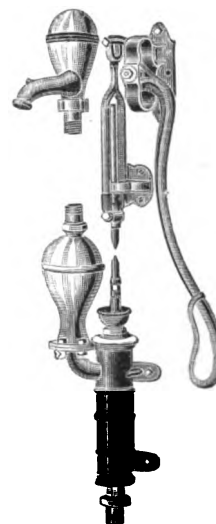


FIG. 281.

FIG. 442. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS CYL.		BRASS.	
							Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.09 gal.	1 in. pipe.	1 in. pipe and 1 in. hose.	100 ft.	Fluke	\$18.00	Fog	\$27.00	Fly	\$35.00
2	2 1/4 "	7 "	.15 "	1 1/4 "	1 1/4 " " 1 "	75 "	Flume	19.00	Foil	28.00	Foal	37.00
3	2 1/2 "	7 "	.18 "	1 1/2 "	1 1/2 " " 1 "	75 "	Flung	20.00	Foiler	29.00	Foaling	40.00
4	3 "	7 "	.21 "	1 1/2 "	1 1/2 " " 1 "	75 "	Flush	22.00	Fold	30.00	Foam	42.00
5	3 1/2 "	7 "	.25 "	1 1/2 "	1 1/2 " " 1 "	50 "	Flute	26.00	Folder	33.00	Foaming	49.00
6	3 1/2 "	7 "	.29 "	1 1/2 "	1 1/2 " " 1 "	50 "	Flusha	28.50	Foliage	37.50	Foeda	56.00

FIG. 281. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS.	
							Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.09 gal.	1 in. pipe.	1 in. pipe.	75 ft.	Dandy	\$13.50	Darned	\$27.00
2	2 1/2 "	7 "	.15 "	1 1/4 "	1 1/4 " "	50 "	Dane	14.00	Dart	28.00
3	2 1/2 "	7 "	.18 "	1 1/4 "	1 1/4 " "	50 "	Danker	14.50	Dash	31.00
4	3 "	7 "	.21 "	1 1/4 "	1 1/4 " "	50 "	Darell	16.50	Date	36.50
5	3 1/4 "	7 "	.25 "	1 1/2 "	1 1/2 " "	35 "	Dared	20.00	Daub	39.50
6	3 1/2 "	7 "	.29 "	2 "	2 " "	35 "	Dark	22.00	Davit	49.50

\* Total lift and force from supply to point of delivery, Pumps not more than 25 feet above water.

# GOULDS HOUSE FORCE PUMPS.

WITHOUT PLANKS.

Fig. 480 represents our House Force Pump, with pitman, guide and guide rod, but with disconnected rod above, for cisterns or wells of any depth.

Fig. 481 is similar to Fig. 480, except that it has not the pitman guide or guide rod. It is, however, just as serviceable for short suction and somewhat cheaper.

The cylinders can be placed at the bottom of well or cistern, or within, say, 15 or 20 feet (suction distance) of water, and then proceed as instructed under Fig. 281, page 128.

The Iron and Brass Cylinder Pumps are fitted for wrought-iron pipe and the Brass Pumps for lead pipe, unless otherwise ordered.

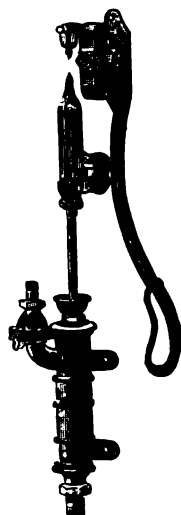


FIG. 480.

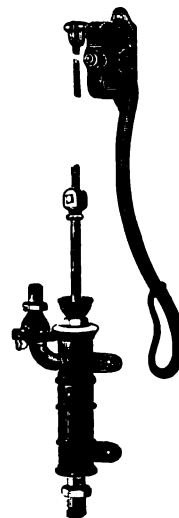


FIG. 481.

FIG. 480. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS.	
							Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.09 gal.	1 in. pipe.	1 in. pipe.	80 ft.	Grass	\$13.00	Grim	\$23.50
2	2½ "	7 "	.15 "	1½ "	1½ "	60 "	Grate	13.50	Grinab	24.50
3	2¾ "	7 "	.18 "	1¾ "	1¾ "	60 "	Gray	14.00	Grip	27.50
4	3 "	7 "	.21 "	1½ "	1½ "	60 "	Graze	15.50	Grist	33.00
5	3½ "	7 "	.25 "	1½ "	1½ "	40 "	Greet	19.00	Grit	36.00
6	3¾ "	7 "	.29 "	2 "	2 "	40 "	Grew	20.50	Groom	46.00

FIG. 481. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS.	
							Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.09 gal.	1 in. pipe.	1 in. pipe.	80 ft.	Grope	\$10.75	Grun	\$21.00
2	2½ "	7 "	.15 "	1½ "	1½ "	60 "	Group	11.00	Guard	22.00
3	2¾ "	7 "	.18 "	1¾ "	1¾ "	60 "	Grout	11.50	Guess	25.00
4	3 "	7 "	.21 "	1½ "	1½ "	60 "	Grow	13.00	Guide	30.00
5	3½ "	7 "	.25 "	1½ "	1½ "	40 "	Grub	16.00	Guile	33.00
6	3¾ "	7 "	.29 "	2 "	2 "	40 "	Gruel	17.50	Gulf	43.00

\* Total lift and force from supply to point of delivery, Pumps not more than 25 feet above water.

# GOULDS HOUSE FORCE PUMPS.

MOUNTED ON PLANK, WITH CRANK AND BALANCE WHEEL.

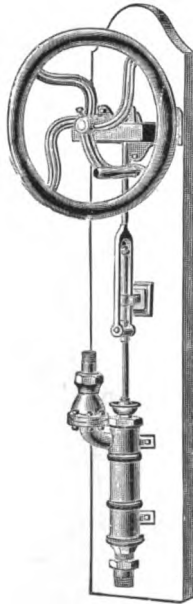


Fig. 712 shows our Single-Acting House Force Pump, with check valve, mounted on plank, with crank shaft and balance wheel, which will be found a welcome substitute for the ordinary lever where any considerable quantity of water is to be raised.

Fig. 713 is the same Pump arranged with air chamber instead of check valve, and we recommend this form where water is to be lifted any distance above Pump.

We can also furnish our Double-Acting Pumps, like Figs. 271 and 273 (page 132), mounted in the same way, if desired. We give lists on both kinds of Pumps below.

In ordering, always state whether you want a Single or Double-Acting Pump. We can construct these Pumps of brass, if so ordered — also add a cock to the air chamber — at proportionate advance in list.

Iron and Brass Cylinder Pumps are fitted for wrought-iron pipe and Brass Pumps for lead pipe, unless otherwise ordered.

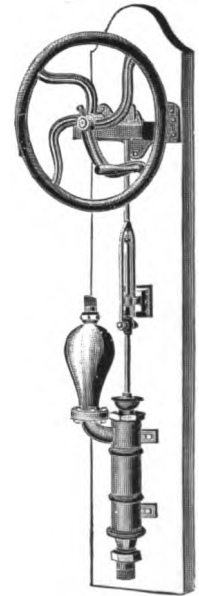


FIG. 712.

FIG. 712. SIZES, PRICES, ETC.

FIG. 713.

No.	Dia. Cyl.	Stroke.	Suction.	Discharge.	* Lift and Force.	SINGLE-ACTING PUMP.			DOUBLE-ACTING PUMP.		
						Capacity per Stroke.	Cipher.	Price.	Capacity per Rev.	Cipher.	Price.
2	2½ in.	7 in.	1½ in. pipe.	1½ in. pipe.	80 ft.	.15 gal.	Tabor	\$27.00	.30 gal.	Talon	\$29.00
3	2½ "	7 "	1½ "	1½ "	60 "	.18 "	Tack	29.00	.36 "	Tame	33.00
4	3 "	7 "	1½ "	1½ "	60 "	.21 "	Tagar	32.00	.43 "	Tank	36.50
5	3½ "	7 "	1½ "	1½ "	40 "	.25 "	Tail	35.00			
6	3½ "	7 "	1½ or 2 "	1½ or 2 "	40 "	.29 "	Tally	39.00	.58 "	Tansy	43.00

FIG. 713. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Suction.	Discharge.	* Lift and Force.	SINGLE-ACTING PUMP.			DOUBLE-ACTING PUMP.		
						Capacity per Stroke.	Cipher.	Price.	Capacity per Rev.	Cipher.	Price.
2	2½ in.	7 in.	1½ in. pipe.	1½ in. pipe.	100 ft.	.15 gal.	Tareat	\$29.00	.30 gal.	Teamo	\$31.50
3	2½ "	7 "	1½ "	1½ "	75 "	.18 "	Tartes	31.00	.36 "	Teatap	34.00
4	3 "	7 "	1½ "	1½ "	75 "	.21 "	Task	34.50	.43 "	Tenor	38.50
5	3½ "	7 "	1½ "	1½ "	50 "	.25 "	Taxdet	38.00			
6	3½ "	7 "	2 "	2 "	50 "	.29 "	Teaba	42.00	.58 "	Tentap	46.00

\*Total lift and force from supply to point of delivery, Pumps not more than 25 feet above water.

# GOULDS HOUSE FORCE PUMPS.

MOUNTED ON PLANKS. FOR MANUAL AND MACHINE POWER.

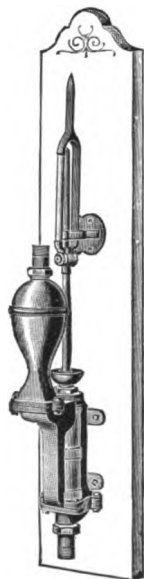


FIG. 452.

Fig. 452 represents our Double-Acting Force Pump, described on opposite page, mounted on plank and arranged with pitman and stub end to be connected to face plate above.

Counter shafts, Figs. 711, 650½ and 650 (pages 137 to 139) may be employed to operate.

Air chamber with two outlets at same list price.

Fig. 714 represents our Single-Acting Force Pump without lever, bearer and cock, but with the pitman and guide arranged for power. Counter shafts Figs. 711, 650, 650½ (pages 137 to 139) may be employed to operate.

Brass air chambers made to order at difference in cost of material. When the plank is not sent we deduct \$1.00 from list.

All brass cocks furnished when ordered at advance price.

FIG. 452. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction Fitted for	Discharge. Fitted for	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.18 gal.	1¼ in. pipe.	1¼ in. pipe.	Gape	\$17.50	Gavel	\$30.00
1	2½ "	7 "	.24 "	1¼ "	1¼ "	Garb	19.00	Gavit	34.00
2	2½ "	7 "	.30 "	1¼ "	1¼ "	Gash	21.00	Gay	39.00
3	2½ "	7 "	.36 "	1¼ "	1¼ "	Gasp	23.00	Gaze	46.00
4	3 "	7 "	.43 "	1½ "	1½ "	Gatela	25.00	Gearac	52.00
6	3½ "	8 "	.67 "	1½ "	1½ "	Gaunt	30.00	Gem	74.00
8	4 "	8 "	.87 "	2 "	2 "	Gauze	44.00	Gent	99.00
10	4½ "	8 "	1.10 "	2½ "	2½ "	Gave	58.00	Genus	142.00



FIG. 714.

FIG. 714. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS CYL.		BRASS.	
							Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ in.	7 in.	.15 gal.	1¼ in. pipe.	1¼ in. pipe.	75 ft.	Textok	\$17.00	Warry	\$26.00	Wartles	\$34.00
3	2½ "	7 "	.18 "	1¼ "	1¼ "	75 "	Thaw	17.50	Warsong	26.50	Warwho	35.50
4	3 "	7 "	.21 "	1½ "	1½ "	75 "	Thorn	18.50	Warsunk	27.50	Wary	39.50
5	3½ "	7 "	.25 "	1½ "	1½ "	50 "	Throb	23.00	Wart	30.00	Wasabo	46.00
6	3½ "	7 "	.29 "	2 "	2 "	50 "	Tick	25.00	Warted	34.00	Wase	53.00

\* Total lift and force from supply to point of delivery, Pumps not more than 25 feet above water.

# DOUBLE-ACTING HOUSE FORCE PUMPS.

MOUNTED ON PLANK, RIGHT OR LEFT HANDED.

Fig. 271 represents one of our well-known Double-Acting Force Pumps, mounted on plank, with check valve for house use.

In explanation of a Double-Acting Pump would say that they lift and force water with both the upward and downward motions of the lever, giving double the quantity of water that a Single-Acting Pump of equal size would.

Fig. 273 represents one of our well-known Double-Acting Suction and Force Pumps mounted on plank with air chamber and cock spout. Can be arranged either right or left handed, and discharge may be made through top of air chamber or from spout.

Can furnish with plain air chamber for single or double discharge or with check valve instead, at a reduction in price.

Pumps fitted for hot water with metallic valves at extra charge.

FIG. 271. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Revolution.	Suction.	Discharge.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.19 gal.	1½ in. pipe.	1½ in. pipe.	Clump	\$13.50	Comb	\$26.00
1	2½ "	7 "	.24 "	1½ "	1½ "	Coach	14.00	Comex	28.00
2	2½ "	7 "	.30 "	1½ "	1½ "	Coast	17.00	Cord	38.00
3	2½ "	7 "	.36 "	1½ "	1½ "	Coated	19.00	Corked	45.00
4	3 "	7 "	.43 "	1½ "	1½ "	Coax	21.00	Corny	52.00
6	3½ "	8 "	.67 "	1½ "	1½ "	Codex	25.00	Couch	69.50
8	4 "	8 "	.87 "	2 "	2 "	Coiled	37.00	Court	94.00
10	4½ "	8 "	1.10 "	2½ "	2½ "	Coin	50.00	Crack	136.00

FIG. 271.

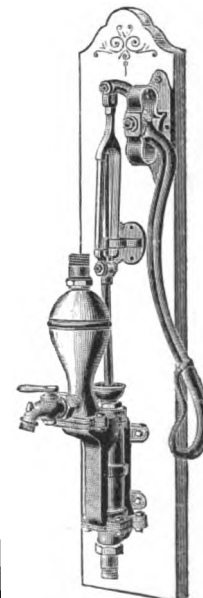
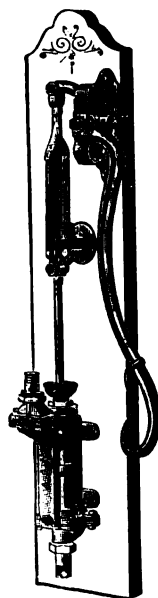


FIG. 273.

FIG. 273. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Revolution.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS.	
							Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.19 gal.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	100 ft.	Verdict	\$18.00	Verifid	\$33.00
1	2½ "	7 "	.24 "	1½ "	1½ " " 1 "	75 "	Verdigr	18.50	Verifier	35.00
2	2½ "	7 "	.30 "	1½ "	1½ " " 1 "	75 "	Verditer	22.00	Verify	45.00
3	2½ "	7 "	.36 "	1½ "	1½ " " 1 "	75 "	Verdure	23.50	Verilyx	52.00
4	3 "	7 "	.43 "	1½ "	1½ " " 1 "	75 "	Verecun	25.50	Verityl	59.00
6	3½ "	8 "	.67 "	1½ "	1½ " " 1 "	50 "	Verge	31.00	Verjuic	78.00
8	4 "	8 "	.87 "	2 "	2 " " 1 "	50 "	Vergers	45.00	Vermes	103.00
10	4½ "	8 "	1.10 "	2½ "	2½ " " 1 "	40 "	Verging	58.00	Vermil	146.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

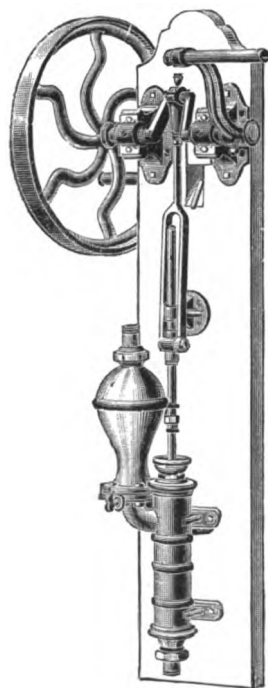


FIG. 449.

## GOULDS HOUSE FORCE PUMPS.

FOR MANUAL AND MACHINE POWER.

Fig. 449 represents our Single-Acting Force Pump on plank with crank shaft, balance wheel and winch handle adapted for two to four men. When so ordered we can supply with 24-inch diameter, 3-inch face pulley balance wheel for belt, at \$3.00 extra list.

Iron and Brass Cylinder Pumps are fitted for wrought-iron pipe and Brass Pumps for lead pipe unless otherwise ordered.

Fig. 450 represents our Double-Acting Force Pump with crank shaft, balance wheel and winch handles adapted for two to four men. When so ordered, we can supply with 24-inch diameter, 3½-inch face pulley balance wheel for belt, at \$3.00 extra list.

Suction and discharge always fitted for wrought-iron pipe, although we can fit for lead pipe if so ordered.

Can also fit these and other Pumps of this class with metallic valves throughout for hot or corrosive liquids.

We deduct \$1.00 from list given below when planks are not furnished.

FIG. 449. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
0	2 in.	7 in.	.09 gal.	1½ in. pipe	1½ in. pipe	Frith	\$37.00	Frost	\$47.00
2	2½ "	7 "	.15 "	1½ "	1½ "	Friz	39.00	Proth	48.00
3	2¾ "	7 "	.18 "	1½ "	1½ "	Frock	39.50	Frown	50.00
4	3 "	7 "	.21 "	1½ "	1½ "	Frog	40.00	Frowzy	60.00
5	3¼ "	7 "	.25 "	1½ "	1½ "	Fromer	44.00	Fruit	72.00
6	3½ "	7 "	.29 "	1½ or 2	1½ or 2	Front	48.00	Fryal	85.00

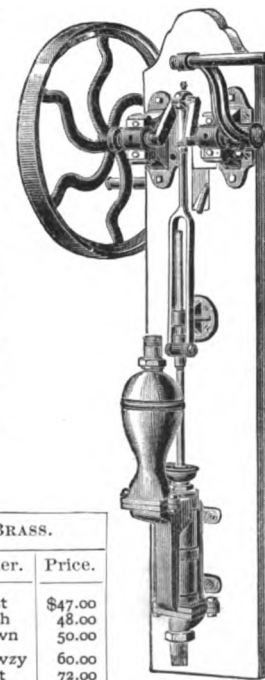


FIG. 450.

FIG. 450. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction Fitted for	Discharge Fitted for	* Lift and Force.	IRON.		BRASS.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	7 in.	.30 gal.	1½ in. pipe.	1½ in. pipe.	75 ft.	Full	\$40.00	Furry	\$61.00
3	2¾ "	7 "	.36 "	1½ "	1½ "	75 "	Fume	42.00	Furlac	68.00
4	3 "	7 "	.43 "	1½ "	1½ "	75 "	Funab	45.00	Furyo	75.00
6	3½ "	7½ "	.62 "	1½ "	1½ "	50 "	Fund	55.00	Furze	94.00
8	4 "	7½ "	.82 "	2 "	2 "	50 "	Fur	65.00	Fuse	119.00
10	4½ "	7½ "	1.03 "	2½ "	2½ "	40 "	Fursa	80.00	Furry	135.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

# DOUBLE-ACTING HOUSE FORCE PUMPS.

MOUNTED ON PLANK. FOR MANUAL AND MACHINE POWER

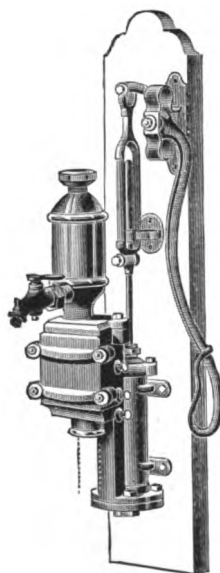


FIG. 876.

Fig. 876 represents our new style Double-Acting Force Pump with pitman guide, guide rod and brass piston rod. The suction and discharge valves are of special type, made of bronze, rubber-faced, and are grouped together in valve chest in front. These can be readily exposed and repaired if necessary by removing front cover plate. Suction pipe plate underneath valve box permits of change in size of pipe if required. Plugs are provided for draining Pump of water in cold weather.

Fig. 879 represents same Pump mounted on plank, with pitman guide, etc., for machine power. Pump may be operated by Figs. 711, 650½ or 650, direct or geared counter shafts, as shown, pages 137 to 139.

When cocks are not furnished, we deduct \$2.00 from list prices.



FIG. 879.

FIG. 876. SIZES, PRICES, ETC.

No.	Diameter Cylinder.	Stroke.	Capacity per Revolution.	Suction.	Discharge.	* Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.26 gal.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	75 ft.	Waveless	\$25.00
4	3 " "	6 " "	.37 " "	1½ " "	1½ " " 1 " "	75 " "	Wavelet	30.00
6	3½ " "	6 " "	.50 " "	2 " "	1½ " " 1 " "	50 " "	Wavelik	37.50
8	4 " "	6 " "	.65 " "	2 " "	2 " " 1 " "	50 " "	Waver	45.00

FIG. 879. SIZES, PRICES, ETC.

No.	Diameter Cylinder.	Stroke.	Capacity per Revolution.	Suction.	Discharge.	* Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.26 gal.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	100 ft.	Waverer	\$24.00
4	3 " "	6 " "	.37 " "	1½ " "	1½ " " 1 " "	100 " "	Waverin	29.00
6	3½ " "	6 " "	.50 " "	2 " "	1½ " " 1 " "	75 " "	Wavesa	36.50
8	4 " "	6 " "	.65 " "	2 " "	2 " " 1 " "	75 " "	Wavewo	44.00

\* Total lift and force from supply to point of delivery, Pumps not more than 25 feet above water.



# GOULDS DOUBLE-ACTING HOUSE FORCE PUMPS.

MOUNTED ON PLANKS. FOR MANUAL POWER.

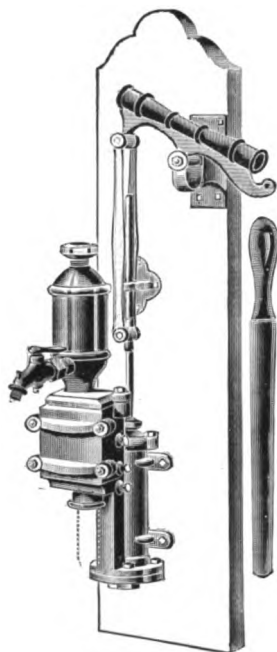


FIG. 875.

Fig. 875 represents our Double-Acting Suction and Force Pump, described on opposite page, arranged with forged pitman and strong brake arm for wood lever, and capable of rendering effective service. Pump may also be driven by Figs. 711, 650½ or 650, counter shafts (pages 137 to 139), by connecting rod to end of brake arm.

Fig. 877 represents the same Pump mounted on heavy plank with crank shaft, stub end, gib and key, plummer blocks, winch handle and fly-wheel, arranged for two or four men and capable of lifting or forcing large quantities of water. We also substitute for either fly-wheel or handle, a pulley 3½-in. face, 24-in. diameter, for belt connection, at \$3.00 extra list. We deduct \$2.00 from list when cock is not furnished.

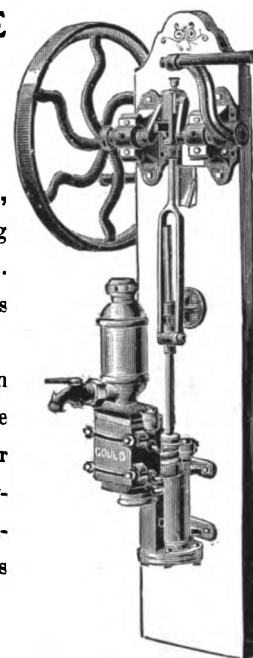


FIG. 877.

FIG. 875. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Revolution.	Suction Fitted for	Discharge Fitted for	* Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.26 gal.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	75 ft.	Waving	\$26.00
4	3 " "	6 " "	.37 " "	1½ " "	1½ " " 1 " "	75 " "	Wavy	31.00
6	3½ " "	6 " "	.50 " "	2 " "	1½ " " 1 " "	50 " "	Waive	38.50
8	4 " "	6 " "	.65 " "	2 " "	2 " " 1 " "	50 " "	Waxal	46.00

FIG. 877. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Revolution.	Suction Fitted for	Discharge Fitted for	* Lift and Force.	Cipher.	Price.
2	2½ in.	6 in.	.26 gal.	1½ in. pipe.	1½ in. pipe and 1 in. hose.	75 ft.	Waxclot	\$45.00
4	3 " "	6 " "	.37 " "	1½ " "	1½ " " 1 " "	75 " "	Waxen	45.00
6	3½ " "	6 " "	.50 " "	2 " "	1½ " " 1 " "	50 " "	Waxines	55.00
8	4 " "	6 " "	.65 " "	2 " "	2 " " 1 " "	50 " "	Waxing	65.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

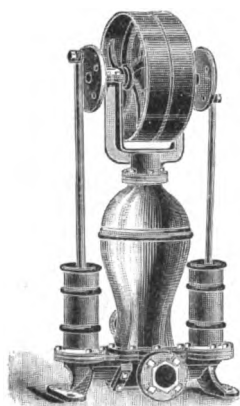


FIG. 457.

## GOULDS TWO-CYLINDER POWER FORCE PUMP.

WITH TIGHT AND LOOSE PULLEYS.

Fig. 457 shows our Open Top Two-Cylinder Force Pump, same as described under Fig. 518 (page 158), except it has upright standards on air chamber bearing tight and loose pulleys for belt power. Pump is double acting in operation and by its construction the bearing boxes provide equal support on each side of pulleys. We always fit as below, unless otherwise ordered.

FIG. 457. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Revolution.	Suction.	Discharge.	* Lift and Force.	IRON CYLINDERS.		BRASS CYLINDERS.	
							Clpher.	Price.	Clpher.	Price.
8	4 in.	8 in.	.87 gal.	2½ in. pipe.	2 in. pipe.	75 ft.	Gimp	\$90.00	Live	\$105.00
12	5 "	8 "	1.36 "	2½ "	2 "	75 "	Gipsy	105.00	Loafam	130.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

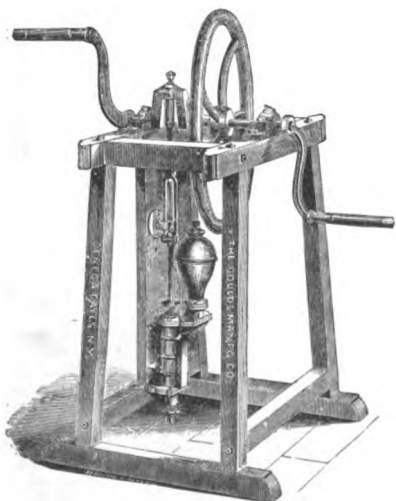


FIG. 655.

## GOULDS HOUSE FORCE PUMP.

MOUNTED ON WOOD FRAME, WITH HEAVY FLY-WHEEL AND CRANK SHAFT.

Fig. 655 shows our Double-Acting Force Pump mounted on wood frame, an appliance very often desired for filling tanks, reservoirs, etc. From two to four men can work on the Pump. When parties desire to make the wood frames themselves, we will furnish the Pump, fly-wheel, shaft, boxes, etc., at a reduction in list price.

FIG. 655. (REGARD.) SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Suction.	Discharge.	* Lift and Force.	DOUBLE-ACTING PUMP.		
						Capacity per Rev.	Iron.	Brass.
1	2½ in.	7 in.	1½ in. pipe.	1½ in. pipe.	75 ft.	.48 gal.	\$56.00	\$68.00
2	2½ "	7 "	1½ "	1½ "	75 "	.60 "	57.00	72.00
3	2½ "	7 "	1½ "	1½ "	75 "	.72 "	58.50	77.50
4	3 "	7 "	1½ "	1½ "	75 "	.86 "	63.00	83.00
5	3½ "	7 "	1½ "	1½ "	50 "	. . .	. . .	. . .
6	3½ "	8 "	1½ "	1½ "	50 "	1.34 "	74.00	114.00
8	4 "	8 "	2 "	2 "	50 "	1.74 "	95.00	119.00
10	4½ "	8 "	2½ "	2½ "	40 "	2.20 "	96.00	185.00
12	5 "	8 "	2½ "	2½ "	40 "	. . .	. . .	. . .

\* Total lift and force from supply to point of delivery.

# GOULDS OVERHEAD COUNTER SHAFT.

FOR OPERATING POWER PUMPS.

Fig. 711 represents a light Counter Shaft consisting of hangers, tight and loose pulleys, face plate, wrist pin and stub rod for driving any of our smaller Power Pumps, such as Fig. 279, illustrated below.

Can change sizes of pulleys enumerated in our tables to meet requirements, at proportionate prices.

FIG. 711. SIZES, PRICES, ETC.

No.	Stroke.	Drop of Hanger.	Pulleys, Each.	* Will Operate.	Cipher.	Price.
1	6 in.	12 in.	16 x 3½ in.	4 in. Cyl., 55 ft.	Syrup	\$30.00
2	8 "	12 "	18 x 4 "	5 " 25 "	Sythe	35.00
	8 "			4 " 70 "		
	8 "			5 " 50 "		
3	6 "	12 "	22 x 5 "	4 " 100 "	Table	45.00
	8 "			5 " 50 "		
	10 "			6 " 25 "		

\* Smaller Cylinders proportionally deeper.

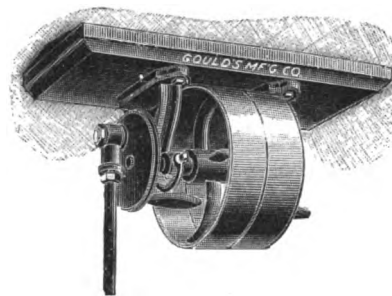


FIG. 711.

# GOULDS POWER FORCE PUMP.

MOUNTED ON PLANK. FOR MACHINE POWER.

Fig. 279 represents a heavy pattern Power Force Pump, mounted on plank with forged pitman and stub end for connecting to face plate of Counter Shaft above, and air chamber with double discharge. It is extra strong and heavy and regularly fitted with leather valves and packing.

We can, however, fit with metallic valves throughout for pumping hot or corrosive liquids at extra charge.

FIG. 279. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction Fitted for	Discharge Fitted for	* Lift and Force.	IRON.		BRASS.	
							Cipher.	Price.	Cipher.	Price.
8	4 in.	8 in.	.43 gal.	2 in. pipe.	2 in. pipe.	75 ft.	Daily	\$30.00	Dale	\$86.00
12	5 "	10 "	.85 "	2½ "	2½ "	75 "	Daisy	40.00	Damer	126.00
16	6 "	10 "	1.22 "	3 "	3 "	50 "	Dairy	55.00	Dam	150.00

\* Total lift and force from supply to point of delivery.

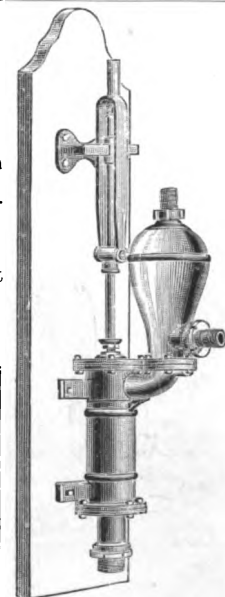


FIG. 279.

## GOULDS OVERHEAD GEARED COUNTER SHAFT.

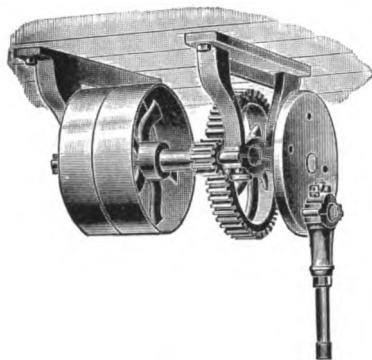


FIG. 650½.

Fig. 650½ represents our Overhead Geared Counter Shaft with plummer blocks, tight and loose pulleys, face plate with pin for varying stroke, connecting rod for driving Power Pumps such as Figs. 714, 452, etc., located underneath. We make this Counter Shaft in shorter strokes only, but can fully recommend for duty specified in our table below. Prices do not include wood frame.

FIG. 650½. SIZES, PRICES, ETC.

No.	Stroke.	Dia. Large Gear.	Dia. Small Gear.	Face of Gears.	Pulleys, Each.	Will Operate	Cipher.	Price.
1 1 A	10 in. 12, 14 or 16 in.	12 in. 12 "	4 in. 4 "	2½ in. 2½ "	16 x 4 in. 16 x 4 "	4 in. Cyl., 90 ft. 4 " 60 "	Beater Casern	\$50.00 60.00

## GOULDS GEARED DRIVING SHAFT.

FOR OPERATING DEEP WELL PUMPS.

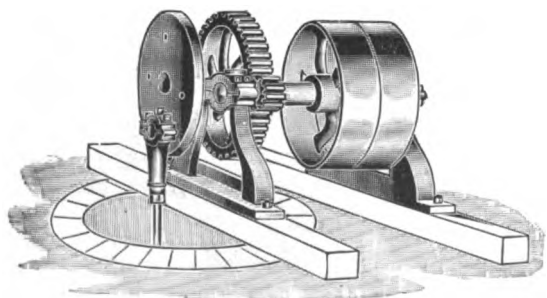


FIG. 650½.

We illustrate herewith our Geared Driving Shaft adapted for placing in part over well or shaft, or just at the edge, the face plate only projecting, for working Single or Double-Acting Pumps, such as Figs. 714 and 452 (pages 131 and 133).

Driving Shaft is the same in all particulars as Counter Shaft described above. Our prices given above do not include wood frame, which we can, however, supply at extra price if ordered.

## GOULDS OVERHEAD GEARED COUNTER SHAFT.

Fig. 650 represents our Overhead Geared Counter Shaft, mounted on heavy oak frame, with wrought-iron stay rods ready for putting in place, without either bed plate or alignment of plummer blocks, etc. Counter Shaft has spur and pinion gear, plummer blocks, tight and loose pulleys, face plate with pin for varying stroke and connecting rod, which may be used as shown in engraving, overhead, for driving any of our larger sizes vertical Power Piston Pumps, such as Figs. 279, 339 or 283, located underneath.

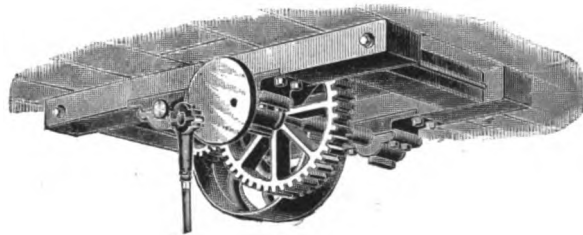


FIG. 650.

FIG. 650. SIZES, PRICES, ETC.

No.	Stroke.	Dia. Large Gear.	Dia. Small Gear.	Face of Gears.	Pulleys, Each.	* Will operate.	Cipher.	Price.
2	10 in.	22 in.	7 $\frac{3}{4}$ in.	3 $\frac{1}{2}$ in.	22 x 5 $\frac{1}{2}$ in.		Beef	\$125.00
2 A	12, 16, or 18 in.	22 "	7 $\frac{3}{4}$ "	3 $\frac{1}{2}$ "	22 x 5 $\frac{1}{2}$ "		Cason	140.00
2 B	20, 22, or 24 "	22 "	7 $\frac{3}{4}$ "	3 $\frac{1}{2}$ "	22 x 5 $\frac{1}{2}$ "		Casort	150.00
2 C	26, 28, or 30 "	22 "	7 $\frac{3}{4}$ "	3 $\frac{1}{2}$ "	22 x 5 $\frac{1}{2}$ "		Chestad	160.00

\* Working Heads are practically strong enough to operate any suitable Pumps to such depth as they are adapted; this is told in connection with Pumps to which we refer.

## GOULDS GEARED DRIVING SHAFT.

FOR OPERATING DEEP WELL PUMPS.

We show in engraving Geared Driving Shaft, same as described above, as adapted for placing in part over a well or shaft, the face plate only projecting, for working Single or Double Acting Pumps in deep wells. Driving Shaft may be operated by any motive power, as steam, gas or oil engines. Our Figs. 616, 624, 548, and 904 Cylinders (pages 83 to 89) may be used with this Driving Shaft.

Sizes, prices, etc., same as given above.

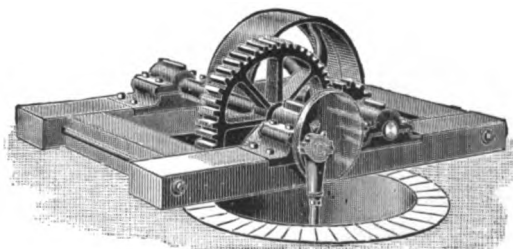


FIG. 650.

The illustration is divided into three horizontal sections, each showing a different room and its connection to a central plumbing system.

- Top Section:** Shows a bedroom with a bed, a lamp, and a large wooden cistern on the roof. A vertical pipe runs down from the cistern.
- Middle Section:** Shows a bathroom with a bathtub and a water heater. Labels include "CITY SUPPLY TO FANCT & WATER CLOSET" and "HOT & COLD CISTERN WATER".
- Bottom Section:** Shows a laundry room with a tub and a sink. Labels include "HOT & COLD CISTERN WATER", "CITY SUPPLY", and "CISTERN".

Different methods of piping and thereby controlling Water Lifter are noticed on following pages and described in detail in our special catalogue of these goods.

# GOULDS DUPLEX BRASS WATER LIFTER.

AN AUTOMATIC PUMP, OPERATED BY WATER PRESSURE.

Fig. 936 represents our Duplex Water Lifter, a miniature pumping engine, complete, perfect, automatic. It is made entirely of brass or bronze, excepting the cross stand and drip pan. Pistons are fitted with cup leather packings. Pump valves are of the disk pattern, without springs, properly guided to insure true action and full, free openings. Valves and seats are removable when worn. The power cylinders each have a plain slide valve in one piece, moved positively by valve stem, and rocker arm connection with the piston rods. A removable valve plate with openings, corresponding to the power cylinder port openings, spans the two power cylinders, and upon this the two slide valves travel. These parts are all of bronze. If the slide valve or plate valve become worn or damaged by grit or other foreign matter, they are easily removed for repair or renewal. See page 145 for table of "Pumping Capacities" and "Power."

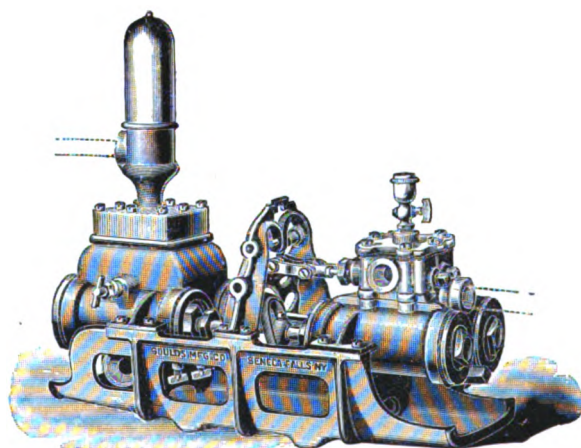


FIG. 936.

FIG. 936. SIZES, PRICES, ETC.

No.	DIAMETER OF CYLINDERS.		Stroke.	CAPACITY PER REVOLUTION.		* Lift and Force.	SIZES OF PIPE CONNECTIONS.				Cipher.	† Price.
	Power.	Pump.		Power Cyl.	Pump Cyl.		Power Cylinders.		Pump Cylinders.			
							Supply.	Exhaust.	Suction.	Delivery.		
1	2 in.	1½ in.	3 in.	.16 gal.	.06 gal.	150 ft.	½ in.	½ in.	½ in.	½ in.	Welterd	\$41.50
2	2½ "	1¾ "	3 "	.26 "	.06 "	150 "	½ "	½ "	½ "	½ "	Welton	43.00
3	2 "	2 "	3 "	.16 "	.16 "	150 "	½ "	½ "	1 "	¾ "	Worsend	50.00

\* Total lift and force from supply to point of delivery. Lifter not more than 25 feet above water.

† Including brass swivel elbow for lead pipe, when ordered. Fitted for hot water, \$3.00 extra list.

# GOULDS DUPLEX WATER LIFTER.

AN AUTOMATIC PUMP OPERATED BY WATER PRESSURE.

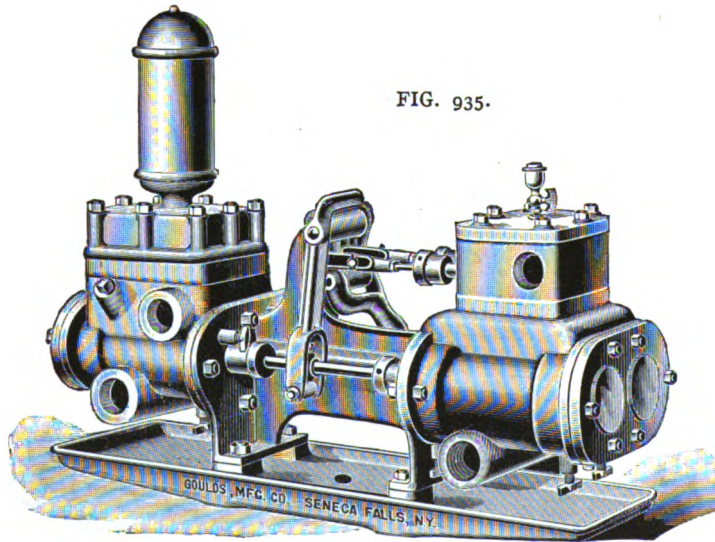


FIG. 935.

Fig. 935 is the same in construction as Fig. 936, excepting the cylinders, which are iron with brass linings. It also has extra large pumping capacity, as will be noticed from the table of pumping capacities on page 145. All pistons are fitted with cup leather packings. The pump valves are the disk pattern, and valves and seats are readily removable when worn. The power cylinders each have a plain slide valve in one piece, moved positively by valve stem, and rocker arm connection with the piston rods. A removable valve plate, with openings corresponding to the power cylinder

port openings, spans the two power cylinders, and upon this the two slide valves travel. These parts are all of bronze. Lifter is securely mounted on substantial base. See page 145 for tables of "Pumping Capacities" and "Power."

FIG. 935. SIZES, PRICES, ETC.

No.	DIAMETER OF CYLINDERS.		Stroke.	CAPACITY PER REVOLUTION.		* Lift and Force.	SIZES OF PIPE CONNECTIONS.				Cipher.	†Brass Lined.
							Power Cylinders.		Pump Cylinders.			
	Power.	Pump.		Power Cyl.	Pump Cyl.		Supply.	Exhaust.	Suction.	Delivery.		
10	3 in.	2 in.	4 in.	.49 gal.	.22 gal.	150 ft.	1½ in.	1½ in.	1½ in.	1½ in.	Worsepr	\$70.00
11	3 "	2½ "	4 "	.49 "	.34 "	150 "	1½ "	1½ "	1½ "	1½ "	Wrasaid	75.00
12	3 "	3 "	4 "	.49 "	.49 "	150 "	1½ "	1½ "	1½ "	1½ "	Wrather	80.00

\* Total lift and force from supply to point of delivery, Lifter not more than 25 feet above water.

† Including brass swivel elbow for connecting to lead pipe when ordered. Fitted for hot water, \$3.00 extra list.



## GOULDS DUPLEX HYDRAULIC AMMONIA PUMP.

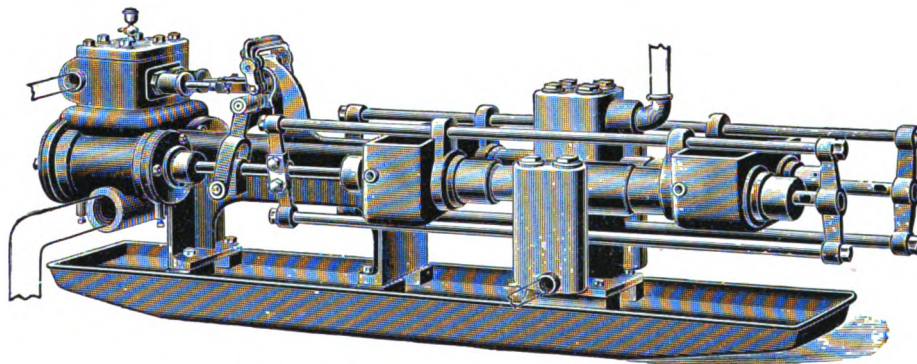


FIG. 937.

Fig. 937, Duplex Hydraulic Ammonia Pump, is similar in design to the ordinary duplex steam pump, but arranged to be operated by water pressure instead of steam. It is a neat, compact little Pump, and will be found useful where aqua ammonia is to be handled in limited quantities. It is also used to reinforce water pressure for any purpose, and is capable of operating against pressures twelve or fifteen times greater than the pressure in the Pump Cylinder. Limit pumping capacity is about 75 gallons per hour.

FIG. 937. SIZES, PRICE, ETC.

No.	DIAMETER OF CYLINDERS.		Stroke.	CAPACITY PER REVOLUTION.		Lmit Pressure per Sq. In.	SIZES OF PIPE CONNECTIONS.				Cipher.	Price.
	Power.	Pump.		Power Cyl.	Pump Cyl.		Power Cylinders.		Pump Cylinders.			
							Supply.	Exhaust.	Suction.	Delivery.		
15	3 in.	¼ in.	4 in.	.48 gal.	.03 gal.	250 lbs.	1¼ in.	1½ in.	¾ in.	¾ in.	Eason	\$170.00

## SWIVEL ELBOW FOR DUPLEX WATER LIFTERS.

With these Brass Unions, iron or lead connection can be made at any angle and without danger of disturbing Lifter. Pipe may be led from Lifter at any angle or direction by revolving Swivel into position.

Fig. 1050. SIZES AND PRICES

$\frac{1}{2}$ in.	iron and lead pipe, finished, each	.	.	.	.	.	.	.	.	.	.	\$0.50
$\frac{3}{4}$ "	" " " " " "	.	.	.	.	.	.	.	.	.	.	0.75
1 "	" " " " " "	.	.	.	.	.	.	.	.	.	.	1.00

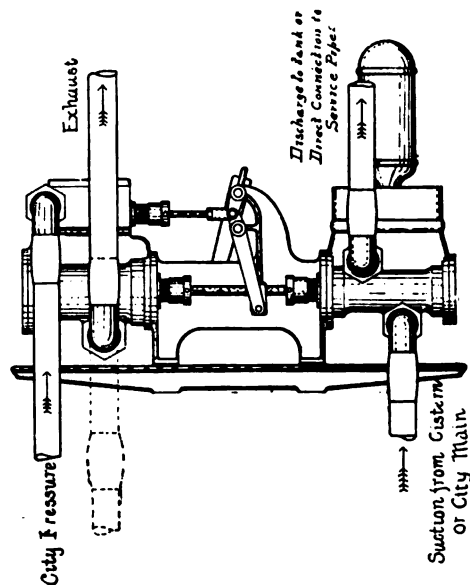


FIG. 1050.

## PLAN OF PIPING DUPLEX WATER LIFTER.

WHEN the Water Lifter takes suction from cistern, spring or elsewhere, make the suction pipe as short and direct as possible and do not place the Lifter higher than necessary, the limits of suction being 20 to 25 feet vertical distance between the Pump and water.

For piping, we would refer to the adjoining diagram showing the Lifter operated by city pressure and elevating the exhaust to a point above the Pump (or into sewer) taking suction from cistern or city main, and discharging to tank in an upper story or directly into the service pipes of the house.



In piping up a Duplex Water Lifter, it is always well to place a valve in each of the several pipe connections in order to shut off the water when desired. The Lifter cylinders are all provided with drip cocks for draining them free from water.

We have given only very general directions for this work of placing a Water Lifter, believing that the intelligent pipe fitter or plumber will readily accomplish the details and complete the installation in good shape.

# PUMPING CAPACITIES GOULDS DUPLEX WATER LIFTERS.

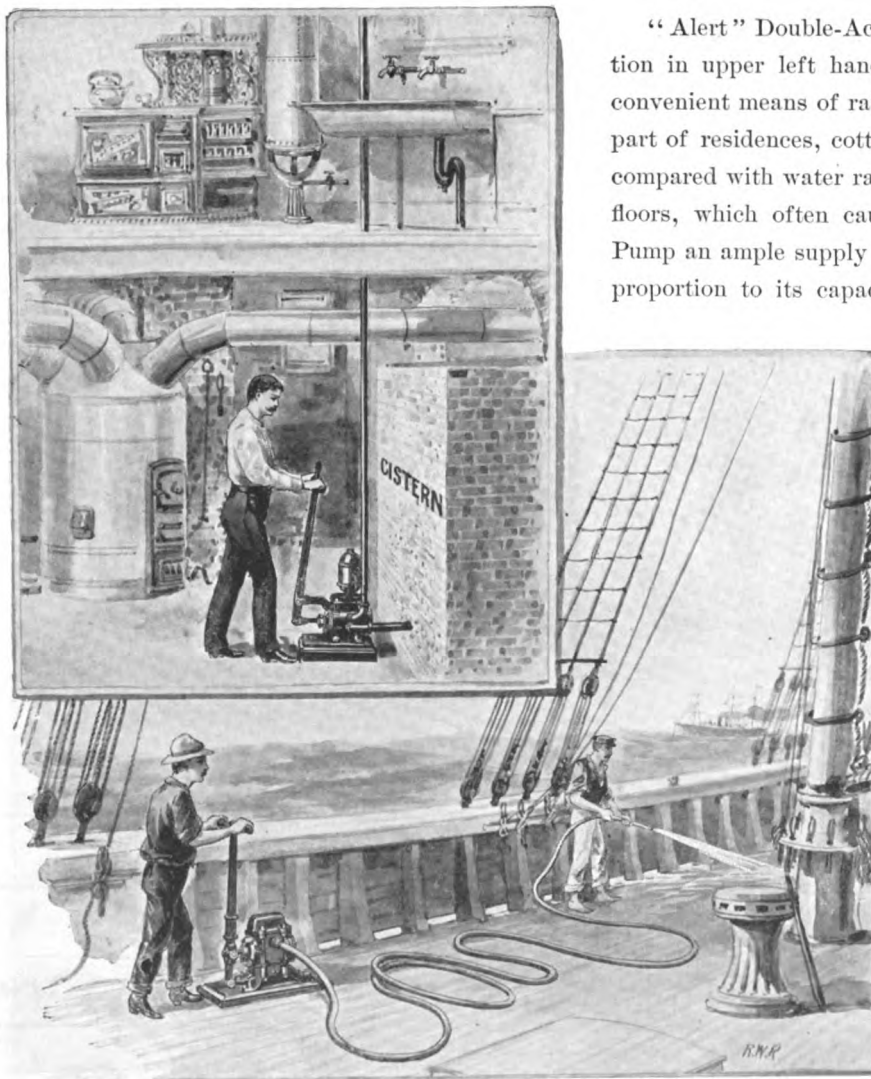
	POWER CYLINDERS.			PUMP CYLINDERS.			PROPORTIONATE CAPACITY.		Gals. Pumped per Hour.*
	Dia.	Stroke.	Gals. per Rev. †	Dia.	Stroke.	Gals. per Rev. †	Gals. Pumped.	Gals. Wasted.	
Fig. 936. No. 1 . .	2 in.	3 in.	.163	1 ¼ in.	3 in.	.063	10	26	150
" " 2 . .	2 ½ "	3 "	.254	1 ¼ "	3 "	.063	10	40	150
" " 3 . .	2 "	3 "	.163	2 "	3 "	.163	10	10	375
Fig. 935. No. 10 . .	3 in.	4 in.	.489	2 in.	4 in.	.217	10	23	500
" " 11 . .	3 "	4 "	.489	2 ½ "	4 "	.340	10	15	800
" " 12 . .	3 "	4 "	.489	3 "	4 "	.489	10	10	1100
Fig. 937. No. 15 . .	3 in.	4 in.	.489	¾ in.	4 in.	.0305	10	160	73

\* Capacity per hour is based upon a speed of 40 revolutions per minute.

† By "Rev." is meant four single strokes, the effect of which is to fill and deliver each cylinder twice.

# PUMPING POWER OF GOULDS DUPLEX WATER LIFTERS.

	Pumping from Cistern to Elevated Tank. The Power Cylinders exhausting freely.		Pumping from Cistern to Elevated Tank. The Power Cylinders elevating the Exhaust.			Pumping City Water higher than it will rise by its own Pressure. The Power Cylinders exhausting freely.	
	With Pressure on Power Cylinders.	Will Elevate Above Cistern.	With Pressure on Power Cylinders.	Will Elevate Above Cistern.	When Exhausting Above Lifter.	With Pressure on Power Cylinders.	Will Elevate Above Lifter.
Fig. 936. No. 1.	15 lbs.	45 ft.	25 lbs.	38 ft.	20 ft.	12 lbs.	45 ft.
	25 "	75 "	35 "	76 "	10 "	20 "	75 "
	35 "	105 "	50 "	115 "	10 "	40 "	145 "
Fig. 936. No. 2.	10 lbs.	50 ft.	20 lbs.	60 ft.	10 ft.	10 lbs.	52 ft.
	15 "	75 "	30 "	40 "	20 "	15 "	78 "
	20 "	100 "		100 "	10 "	20 "	94 "
Fig. 936. No. 3.	30 lbs.	36 ft.	35 lbs.	25 ft.	20 ft.		
	40 "	48 "	50 "	45 "	10 "		
	50 "	60 "	75 "	70 "	10 "		
Fig. 935. No. 10.	15 lbs.	39 ft.	25 lbs.	33 ft.	20 ft.	10 lbs.	32 ft.
	25 "	65 "		78 "	10 "	15 "	48 "
	35 "	91 "	40 "	67 "	20 "	20 "	65 "
Fig. 935. No. 11.	20 lbs.	33 ft.	35 lbs.	36 ft.	20 ft.		
	45 "	60 "		79 "	10 "		
	60 "	100 "	60 "	72 "	20 "		
Fig. 935. No. 12.	30 lbs.	35 ft.	45 lbs.	30 ft.	20 ft.		
	45 "	54 "	60 "	55 "	10 "		
	60 "	72 "	90 "	80 "	20 "		



"Alert" Double-Acting Force Pump, shown in operation in upper left hand corner of sketch, offers a most convenient means of raising and distributing water to any part of residences, cottages, etc., while cost is minimum, compared with water rates or large supply tanks on upper floors, which often cause so much trouble. With this Pump an ample supply of pure soft water is ensured. In proportion to its capacity, it is phenomenally light and can be easily operated by persons of moderate strength, with entire freedom from all jarring and pounding.

This Pump is described under **Fig. 747**, on opposite page.

"Challenge" Double-Acting Force Pump, shown at bottom of sketch, is adapted for practically the same duties as "Alert" Pump, shown above, but is especially designed for use about ships, wharves, warehouses, etc. It is of heavy pattern, with bronze working parts which are unaffected by salt water. This Pump is described under **Fig. 470**, page 148, and other Pumps of this class will be found, pages 147 to 159.

# GOULDS "ALERT" DOUBLE-ACTING FORCE PUMP.

WITH DOUBLE SUCTION AND DISCHARGE OPENINGS.

The "Alert" Double-Acting Force Pump is similar to the "Challenge," which we were first to build and popularize, but instead of the expensive composition valves and valve seats, this Pump has leather valves. In general character it partakes of the Steam Pump style, the valves all being grouped together under the air chamber and can be readily exposed to view by unscrewing the bolts at side, when the whole Pump can be taken apart. The suction and discharge openings, screwed for iron pipe, are on both sides of cylinder (we plug one set), so that suction or discharge can be used on either or both sides, if necessary. We always screw them for sizes of iron pipe named below, but can fit them for lead pipe or hose, if so ordered, at extra charge for Nos. 2 and 4 of \$2.00 and Nos. 6 and 8 of \$2.50.

FIG. 747. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	IRON.		BRASS LINED.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	5 in.	.21 gal.	1½ in. pipe.	1 in. pipe.	75 ft.	Vareb	\$16.00	Baschal	\$17.50
4	3 "	5 "	.31 "	1½ "	1 "	75 "	Varech	18.00	Baschoa	20.00
6	3½ "	5 "	.42 "	1½ "	1½ "	50 "	Viveau	20.00	Basclar	22.50
8	4 "	5 "	.54 "	1½ "	1½ "	50 "	Vivid	24.00	Bascles	27.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

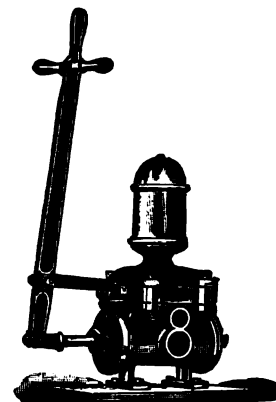


FIG. 747.

# GOULDS "CHALLENGE" DOUBLE-ACTING FORCE PUMP.

WITH BRASS LINED CYLINDER AND METAL VALVES.

Fig. 494 represents our Double-Acting "Challenge" Force Pump, with heavy cast-iron base, and is adapted for every purpose where a stationary Pump of this kind can be used about the house, factory, store, etc. The cylinder is lined with brass; the piston rod, valves and valve seats are brass; the nuts on the rods on either side of the Pump are also brass; so that it will be seen that all parts of the Pump exposed to the action of water are non-corrosive. At each end of bed plate are brass plugs for letting off the water to prevent freezing, while there is another and larger brass plug for priming the Pump when necessary. We can fit suction and discharge for hose or lead pipe, but always fit for wrought-iron pipe unless otherwise ordered.

For Spring Piston (brass) add to list, Nos. 2 and 4, \$3.00; No. 8, \$4.00; No. 12, \$6.00.

FIG. 494. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	BRASS LINED.		BRASS.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	4½ in.	.19 gal.	1½ in. pipe.	1 in. pipe.	150 ft.	Hawk	\$27.00	Loon	\$75.00
4	3 "	4½ "	.28 "	1½ "	1 "	150 "	Hayn	27.00	Lopel	75.00
8	4 "	4½ "	.49 "	1½ "	1½ "	100 "	Hazed	28.00	Losses	90.00
12	5 "	5 "	.84 "	2 "	1½ "	100 "	Hazy	42.00	Lost	110.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

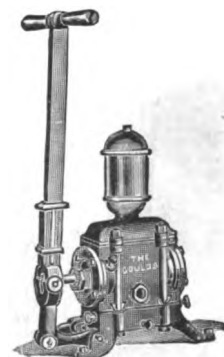


FIG. 494.

# GOULDS "CHALLENGE" DOUBLE-ACTING FORCE PUMP.

WITH BRASS LINED CYLINDER AND METAL VALVES.

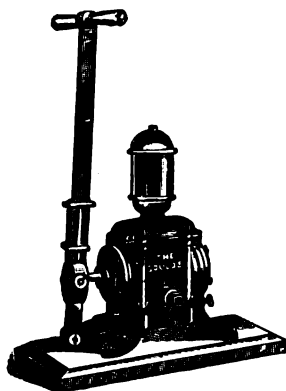


FIG. 470.

The cut represents our "Challenge" Double-Acting Force Pump, on plank, of great compactness and power, for use on shipboard, wharves, around factories, mills, warehouses, etc. The cylinder is lined with brass; the piston, piston rod, valves and valve seats are bronze, so that it will be seen all parts of the Pump exposed to the action of water are non-corrosive.

We fit them usually for hose connections, though we furnish connections for either lead or iron pipe, if ordered. Only one set of connections goes with a Pump at list price.

FIG. 470. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	BRASS LINED.		BRASS.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	4½ in.	.19 gal.	1½ in. hose.	1 in. hose.	150 ft.	Grande	\$27.00	Grantee	\$75.00
4	3 " "	4½ " "	.28 " "	1½ " "	1 " "	150 " "	Grapery	27.00	Gratad	75.00
8	4 " "	4½ " "	.49 " "	1½ " "	1½ " "	100 " "	Grab	28.00	Loned	90.00
12	5 " "	5 " "	.85 " "	2 " "	1½ " "	100 " "	Grace	42.00	Longa	110.00

For Spring Piston (brass) add to list, Nos. 2 and 4, \$3.00; No. 8, \$4.00; No. 12, \$6.00.

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

# GOULDS "CHALLENGE" DOUBLE-ACTING FORCE PUMP.

WITH DOUBLE LEVERS, BRASS LINED CYLINDER AND METAL VALVES.

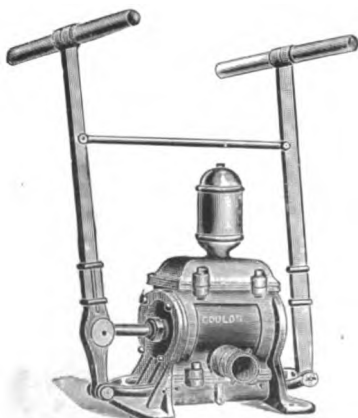


FIG. 562.

Fig. 562 represents our "Challenge" Double-Acting Force Pump, described above, in a larger form, and arranged with double levers. This Pump has only one stuffing box so that it is less liable to leak than with two, and in case of such an accident, one set of valves would be in readiness at all events, and thus arranged can be operated, too, with much less friction and labor. For use on ship wharves, about factories, mills, warehouses, etc., it is capable of inestimable service.

Both suction and discharge fitted for hose unless otherwise ordered. Can be fitted for wrought-iron pipe if desired.

FIG. 562. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	BRASS LINED.		BRASS.	
							Cipher.	Price.	Cipher.	Price.
12	5 in.	5 in.	.85 gal.	2 in. hose.	1½ in. hose.	125 ft.	Leader	\$45.00	Looky	\$125.00
16	6 " "	5 " "	1.22 " "	2½ " "	2 " "	125 " "	Leaflet	50.00	Looma	175.00

For Spring Piston (brass) add to list, No. 12, \$6.00; No. 16, \$8.00.

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

# “MONITOR” D. A. SUCTION AND FORCE PUMP COMBINED.

WITH BRASS-LINED CYLINDER AND METAL VALVES.

(Patented September 5, 1876.)

The cut exhibits our Double-Acting “Monitor” Suction Pump, for elevating large quantities of water from the holds of vessels, or from wells, cisterns, reservoirs, etc. It is essentially a Brass Pump, as the cylinder is lined with that metal, while the piston, piston rod, valves and their seats are made of the best composition metal. By the addition of a very few and inexpensive appliances, this Pump can be converted into a very powerful engine, with a capacity of forcing a good-sized stream of water a long distance, thus combining in one machine, and at a little more cost, a Lifting and Force Pump when required. On shipboard this Pump can be set as Bilge Pumps usually are, with the iron suction pipe extending into the hold, and by very simple changes a Force Pump can be had for extinguishing fires, washing decks, etc. One Pump, therefore, performs the functions of two, and we guarantee that in either capacity it will give all the satisfaction that either of two Pumps would, designed specially for only one purpose.

Under the air chamber, which is easily detached, lie the upper valves, while, by unscrewing the four nuts that secure the bed plate to the cylinder, the cylinder can be raised, and the lower valves are exposed. The position of the Pump or the pipes have, therefore, in no way to be disturbed should the valves become clogged and require examination. We can most heartily commend this Pump to our friends. Both suction and discharge fitted for hose unless otherwise ordered, but we can fit for iron pipe if so desired. For Spring Piston (brass) add to list \$8.00.

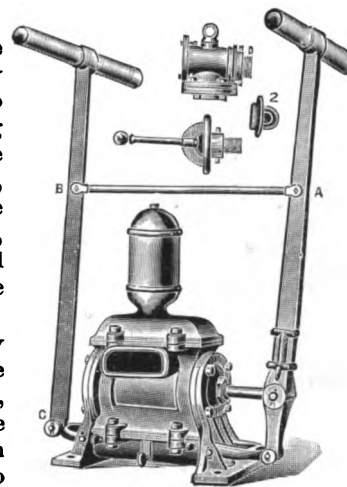


FIG. 581.

FIG. 581. SUCTION AND BILGE PUMP. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Cipher.	Price.
16	6 in.	5 in.	1.22 gal.	2½ in. hose.	Melt	\$50.00

FIG. 582. COMBINED FORCE PUMP. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	Cipher.	Price.
16	6 in.	5 in.	1.22 gal.	2½ in. hose.	2 in. hose.	125 ft.	Mend	\$56.00

\* Total lift and force from supply to point of delivery.

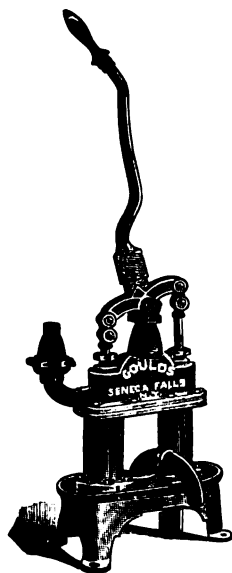


FIG. 773.

## BRASS TWO-CYLINDER FORCE PUMP.

WITH DETACHABLE IRON LEVER.

Fig. 773 represents our Two-Cylinder Force Pump with brass cylinders, check valve, rods and stuffing boxes, making it practically a brass Pump. This Pump has two vertical working pistons actuated by one lever, having the full effect of a double-acting Pump.

The suction and discharge are fitted for lead or iron pipe, as ordered.

FIG. 773. SIZES, PRICES, ETC.

No.	Dia. Cyls.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	Cipher.	Price.
0	2 in.	4 in.	.11 gal.	1½ in. pipe.	1 in. pipe.	150 ft.	Vendor	\$25.00
2	2½ "	4 "	.17 "	1½ "	1½ "	125 "	Vendue	35.00
4	3 "	4 "	.24 "	1½ "	1½ "	100 "	Vener	45.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

## "THRESHER" DOUBLE-ACTING FORCE PUMP.

WITH DETACHABLE WOOD LEVER.

Fig. 1069, "Thresher" Tank Pump (commonly called), has capacity of about 1 to 1½ barrels per minute. In the cylinder are grouped the iron, leather-faced poppet valve, resting on brass valve seats. The discharge valves are accessible through ports or hand holes closed with plugs, while the suction valves below may be exposed by removing either cylinder head. Solid piston is double-crimped packed, and the piston rod of polished steel works through brass stuffing box. Waterways are large and direct. We fit regularly, as specified below.

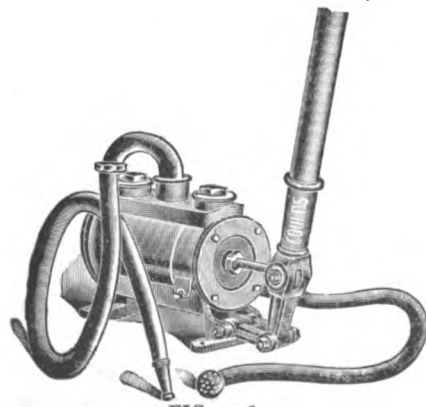


FIG. 1069

SIZE, PRICE, ETC.

Fig. 1069.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	Cipher.	Price.
Pump only.	5 in.	5 in.	.85 gal.	2 in. hose and pipe.	1 in. hose or 2 in. pipe.	50 ft.	Worrel	\$18.00
OUTFIT A,	Fig. 1069, Thresher Tank Pump, with 15 ft. 2-in. spiral wire suction hose, 12½ ft. 1-in. 3-ply discharge hose, couplings, suc. basket and nozzle, all complete (Worrier)							\$40.00
OUTFIT B,	Fig. 1069, Thresher Tank Pump, with 20 ft. 2-in. spiral wire suction hose, 12½ ft. 1-in. 3-ply rubber dis. hose, couplings, suc. basket and nozzle, all complete (Curiousa)							\$45.00
OUTFIT C,	Fig. 1069, Thresher Tank Pump, with 25 ft. 2-in. spiral wire suc. hose, 12½ ft. 1-in. 3-ply discharge hose, couplings, suc. basket and nozzle, all complete (Cymbif)							\$50.00
OUTFIT D,	Fig. 1069, Thresher Tank Pump, with 25 ft. 2-in. spiral wire suction hose, 25 ft. 1-in. 1-ply discharge hose, couplings, suc. basket and nozzle, all complete (Daw)							\$54.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.



# GOULDS "CHALLENGE" DOUBLE-ACTING FORCE PUMP.

WITH PITMAN FOR MACHINE POWER.

Fig. 604 represents our "Challenge" Double-Acting Force Pump, mounted on plank, with pitman, guide and guide rod for attaching to face plate and crank pin by means of connecting rod. May be operated by Figs. 597 or 597½ Horse Powers (pages 110 and 111) or other machine power. They can be run up to a maximum of 40 to 50 revolutions per minute, though 30 would be better. Both suction and discharge fitted for gas pipe, unless otherwise ordered.

FIG. 604. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	BRASS LINED.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	4½ in.	.19 gal.	1½ in. pipe.	1 in. pipe.	Molec	\$30.00	Vendeed	\$80.00
4	3 "	4½ "	.28 "	1½ "	1 "	Molty	30.00	Vendela	80.00
8	4 "	4½ "	.49 "	1½ "	1½ "	Monkish	32.00	Venderb	95.00
12	5 "	5 "	.85 "	2 "	1½ "	Moody	50.00	Vendib	120.00
16	6 "	5 "	1.22 "	2½ "	2 "	Moon	55.00	Vendibly	170.00

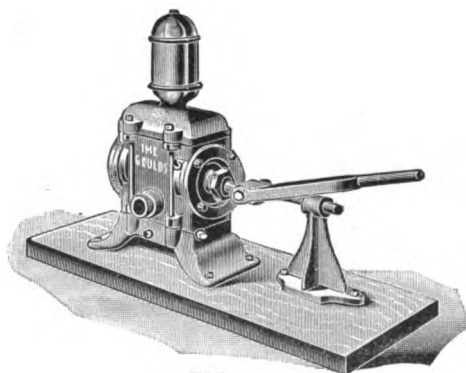


FIG. 604.

# GOULDS "CHALLENGE" DOUBLE-ACTING FORCE PUMP.

ON PLATFORM WITH WHEELS.

Fig. 774 represents "Challenge" Double-Acting Force Pump, described on page 148, mounted on platform with wheels for portable use.

The platform brake answers a two-fold purpose, being large enough to admit of the operator standing upon it while working the Pump, and at the same time holding it firm and steady.

Suction and discharge always fitted for hose, unless otherwise ordered.

FIG. 774. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	BRASS LINED.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	2½ in.	4½ in.	.19 gal.	1½ in. hose.	1 in. hose.	Vitrify	\$40.00	Vocalmo	\$90.00
4	3 "	4½ "	.28 "	1½ "	1 "	Vitriol	45.00	Vocalny	95.00
8	4 "	4½ "	.49 "	1½ "	1½ "	Vituline	53.00	Vocams	115.00



FIG. 774.

## GOULDS "NEW DELUGE" SUCTION PUMP.

WITH BRASS LINED CYLINDER AND REMOVABLE VALVES.

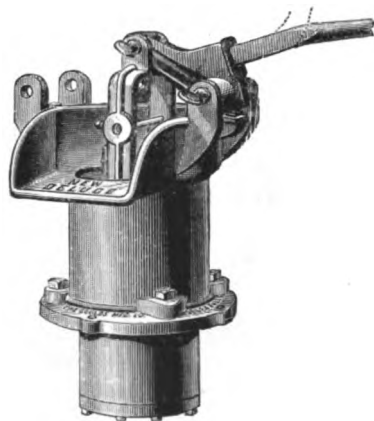


FIG. 829.

Fig. 829 represents our improved "New Deluge" Pump, which is designed for shallow or small vessels of not more than 15 to 20 feet depth of hold; for contractors who wish to pump large quantities of water from excavations, etc.; for irrigation or any other purpose where a compact and capacious Pump is desired.

The Cylinder is lined with brass, the valves rubber-faced and the lever socket made at such an angle that the bent wrought-iron lever when put in one side up is right for ordinary pumping, and by simply changing it to the other side up it becomes a vertical lever. This lever may also be worked from three different points, as shown by lugs in our cut.

The Pump has large valves accessible and removable by hand from above, while to the bottom of the base is bolted a flange which may be cut for any size pipe ordered, or changed for other sizes if desired.

FIG. 829. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	Cipher.	Brass Lined.
6 in.	4 in.	.49 gal.	2½ in. pipe.	20 ft.	Weakend	\$20.00
8½ "	6 "	1.47 "	3 "	20 "	Waking	30.00

Can furnish 8½" x 6" Iron (not Brass Lined) Pump fitted 4" pipe, with special foot valve for pumping asphaltum, at \$50.00 list.

## GOULDS "NEW DELUGE" SUCTION PUMP.

WITH BRASS LINED CYLINDER AND REMOVABLE VALVES.

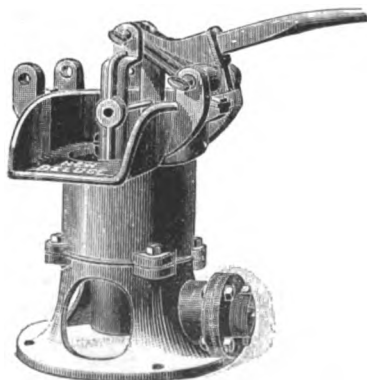


FIG. 836.

Fig. 836 represents our "New Deluge" Pump described above, arranged with elevated base to be used above deck or foundation where it is desired to use hose suction or more convenient to make pipe connections in this manner. The suction flange is fitted for sizes of wrought-iron pipe given below, unless otherwise ordered, or can be cut hose gauge to take our regular suction half hose coupling, which is furnished at extra price.

FIG. 836. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	Cipher.	Brass Lined.
6 in.	4 in.	.49 gal.	2½ in. pipe.	20 ft.	Weakend	\$21.00
8½ "	6 "	1.47 "	3 "	20 "	Weakeos	31.00

## GOULDS "NEW DELUGE" SUCTION PUMP.

AS ADAPTED TO MANUAL OR WIND POWER.

Fig. 868 represents our "New Deluge" Pump, described on opposite page, under style of Fig. 829, with the addition of a heavy forked rod adapting it for power as well as hand use. This forked rod may be connected to wood rod of wind mill, walking beam, or other power, and operated in any place where water is not more than 25 feet distance, for irrigation, in excavations, etc. The suction plate is bolted to base and may be cut for other sizes of pipe than those given below, if desired.

Can also supply with base for side inlet same as Fig. 836, opposite page, at \$1.00 extra list.

FIG. 868. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	Cipher.	Brass Lined.
6 in.	4 in.	.49 gal.	2½ in. pipe.	20 ft.	Wayward	\$21.50
8½ "	6 "	1.47 "	3 " "	20 "	Waywise	31.50

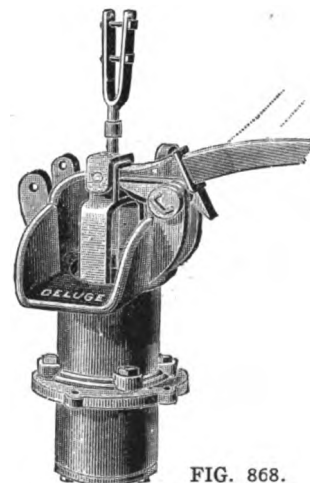


FIG. 868.

## GOULDS "NEW DELUGE" SUCTION PUMP.

FOR BELT POWER.

Fig. 871 represents our "New Deluge" Pump, described on opposite page, surmounted with a strongly-bolted, heavy frame, supporting bearing boxes, with crank shaft, spur and pinion gears, pulley, etc., the whole making a most compact and serviceable device, capable of raising and discharging from 3,000 to 4,000 gallons of water per hour.

The cylinder is brass lined, the valves rubber faced and accessible by hand, although they will pass water containing gravel, sand, sticks, etc., without clogging.

Can supply with base with bottom inlet, same as Fig. 868 above, at reduction of \$1.00 list.

FIG. 871. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	Cipher.	Brass Lined.
6 in.	6 in.	.73 gal.	2½ in. pipe.	20 ft.	Weakly	\$58.00
8½ "	6 "	1.47 "	3 " "	20 "	Weaknes	68.00

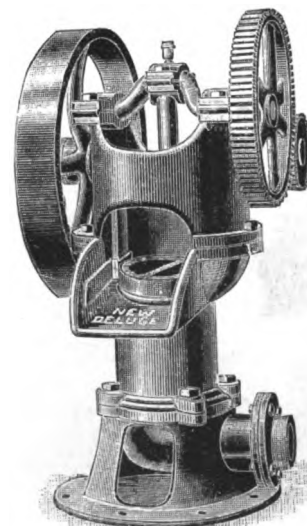


FIG. 871.

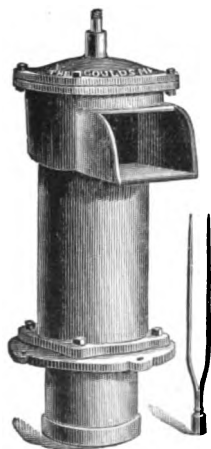


FIG. 1043.

## GOULDS "NEW DELUGE" SUCTION PUMP.

WITH FORK ROD FOR WIND MILL.

Fig. 1043 represents our "New Deluge" Pump (similar to Fig. 829, page 152) with fork rod for Wind Mill. Cylinder is lined with brass; valves are rubber-faced and readily accessible.

This Pump has a special application for pumping water from shallow wells or creeks, 15 to 20 feet distance, for irrigating lands, etc.

Pump will handle muddy or gritty water without choking. Regularly fitted as below.

FIG. 1043. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Lift.	Cipher.	Brass Lined.
6 in.	12 in.	1½ gals.	3 in. pipe.	20 ft.	Bringer	\$25.00
8½ "	12 "	3 "	4 "	20 "	Baldpat	35.00

## GOULDS ODORLESS DIAPHRAGM FORCE PUMP.

WITH REVERSIBLE DOUBLE WROUGHT-IRON LEVERS.

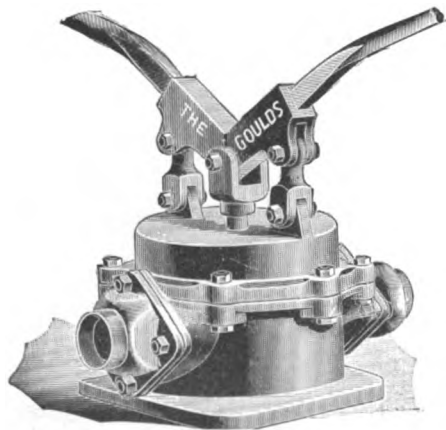


FIG. 1003.

Fig. 1003 represents our perfected Odorless Diaphragm Force Pump specially designed for pumping out sewers, cesspools, vaults, etc. This Pump must not be confused with the common, open top Diaphragm Pumps.

Our construction comprises substantial body, surmounted by bearer top with rubber diaphragm (in effect plunger) securely bolted between. The working rod is so attached to diaphragm that it is not exposed to matter pumped, dispensing with all stuffing boxes, obviating dangers of leakage, either liquid or gas, and rendering operation entirely odorless.

The suction and discharge chambers, comprising valve seats and covers, are composition bronze and incase the inclined rubber valves, which offer smallest obstruction to passage of any matter.

Unless otherwise ordered, we fit for size wrought-iron pipe given below, but can cut to any special hose gauge. Couplings for hose extra.

FIG. 1003. SIZE, PRICE, ETC.

Dia. Diaphragm.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	Cipher.	Price.
13 in.	2½ in.	.81 gal.	3 in. pipe.	3 in. pipe.	Zutaf	\$40.00

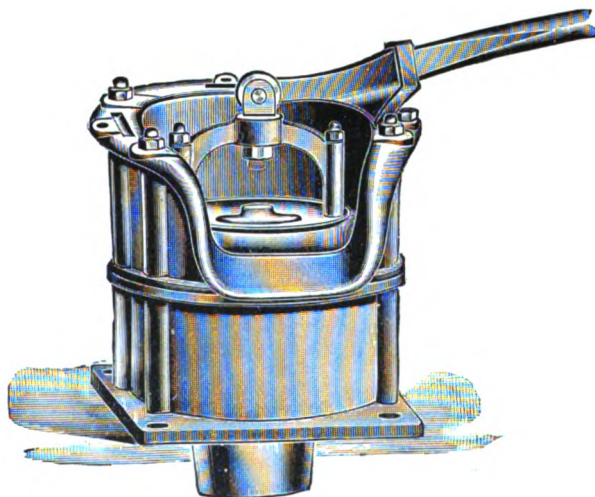


FIG. 1038.

## DIAPHRAGM SUCTION PUMP.

WITH BOTTOM INLET FOR PIPE.

Fig. 1038 represents our new and improved Diaphragm Suction Pump with bottom inlet, fitted for wrought-iron pipe. This is a well proportioned and strongly built Pump, adapted for all kinds of rough work, such as pumping water, mud, sand, gravel, coal, sewage, or any semi-liquid matter.

In this type Pump a rubber diaphragm takes the place of plunger, and is devoid of packing, free of friction, and almost indestructible in use. The lower valve is of metal, rubber faced and wing guided; it is easy of access and readily removable. Lever can be reversed by removing two bolts and swinging lever socket upon its pivot in plunger yoke, a feature which will strongly recommend our Pump.

We regularly fit as given below in our table.

FIG. 1038. SIZE, PRICE, ETC.

Dia. Diaphragm.	Stroke.	Suction.	Capacity per Stroke.	Lift.	Cipher.	Price.
13 in.	2½ in.	3 in. pipe.	.81 gal.	15 ft.	Dodums	\$24.00

## DIAPHRAGM SUCTION PUMP.

WITH SIDE INLET FOR HOSE.

Fig. 1036 represents our improved Diaphragm Suction Pump with side inlet for hose. This Pump embodies all the good features of our Fig. 1038, described above and to which we would refer, differing only in construction of lower valve. The suction and discharge chambers, comprising valve seats and covers, are composition bronze and incase the inclined rubber valves which offer the smallest obstruction to passage of any matter.

Unless otherwise ordered, we fit for size wrought-iron pipe given below, but can cut to any special hose gauge. We can furnish suction hose and couplings to order at market rates.

FIG. 1036. SIZE, PRICE, ETC.

Dia. Diaphragm.	Stroke.	Suction.	Capacity per Stroke.	Lift.	Cipher.	Price.
13 in.	2½ in.	3 in. pipe.	.81 gal.	15 ft.	Dodoma	\$26.00

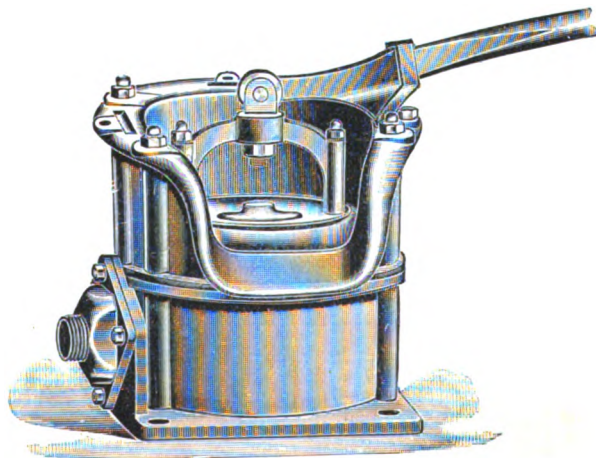


FIG. 1036.

# GOULDS TWO-CYLINDER FORCE PUMPS.

WITH BRAKE TOP.

Fig. 283 exhibits a new Two-Cylinder Force Pump, with wood levers, etc., and may be worked by hand or machinery, while Fig. 284 is the same Pump with folding brakes, which are large enough to admit four or six men working upon them. They are made with brass-cased piston rods, brass plungers, valves and stuffing boxes.

The valve at the bottom of the Cylinder is double and *entirely new* in its construction, and can be readily tripped or opened by pressing down the lever until it strikes the top of the air chamber.

The Pump is simple in its construction, not liable to get out of order, and by the directness of its action and consequent freedom from friction is a most efficient and powerful Pump.

We make them with Iron Cylinders or with Brass Cylinders, with all the *working portions* of the Pump of the same material.

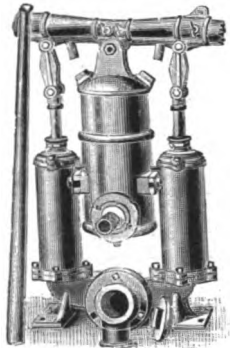


FIG. 283.

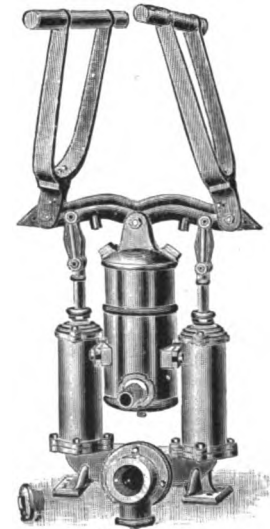


FIG. 284.

FIG. 283. SIZES, PRICES, ETC.

No.	Dia. Cyls.	Stroke.	Capacity per Revolution.	Suction.	Discharge.	* Lift and Force.	IRON CYLS.		BRASS CYLS.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	6 in.	.26 gal.	2 in. pipe.	1½ in. hose.	125 ft.	Dazed	\$38.00	Debar	\$60.00
4	3 "	6 "	.37 "	2 "	1½ "	125 "	Dazle	40.00	Debase	65.00
6	3½ "	6 "	.50 "	2½ "	1½ "	100 "	Deafa	47.00	Debit	78.00
8	4 "	6 "	.65 "	2½ "	1½ "	100 "	Deale	55.00	Debta	95.00
10	4½ "	6 "	.83 "	3 "	2 "	100 "	Deam	70.00	Debut	115.00
12	5 "	8 "	1.36 "	4 "	3 "	75 "	Balse	95.00	Benec	150.00
16	6 "	8 "	1.96 "	4 "	3 "	75 "	Dear	110.00	Decay	170.00

FIG. 284. SIZES, PRICES, ETC.

2	2½ in.	6 in.	.26 gal.	2 in. pipe.	1½ in. hose.	125 ft.	Deck	\$58.00	Deep	\$80.00
4	3 "	6 "	.37 "	2 "	1½ "	125 "	Decker	60.00	Deeply	85.00
6	3½ "	6 "	.50 "	2½ "	1½ "	100 "	Decoyed	67.00	Deera	98.00
8	4 "	6 "	.65 "	2½ "	1½ "	100 "	Decry	75.00	Defer	115.00
10	4½ "	6 "	.83 "	3 "	2 "	100 "	Deedo	90.00	Defix	135.00
12	5 "	8 "	1.36 "	4 "	3 "	75 "	Belted	115.00	Blown	170.00
16	6 "	8 "	1.96 "	4 "	3 "	75 "	Deema	130.00	Deftly	190.00

\* Total lift and force from supply to point of delivery, Pumps not more than 25 feet above water.

# GOULDS TWO-CYLINDER FORCE PUMP.

WITH FOLDING BRAKES, ON PLATFORM WITH WHEELS.

This is our Fig. 284 described on opposite page, bolted to a platform on wheels, for convenience of transporting from place to place. With a length of spiral suction hose attached to the Pump it is always in readiness to be carried to the place of necessity, and in case of fire will be found invaluable, for it is a very powerful engine when the brakes are fully equipped.

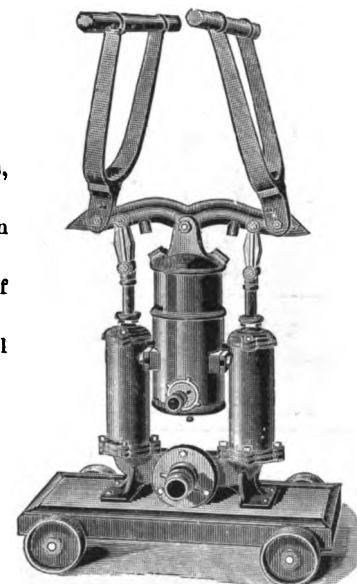


FIG. 285. SIZES, PRICES, ETC.

FIG. 285.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	* Lift and Force.	IRON CYLS.		BRASS CYLS.	
							Cipher.	Price.	Cipher.	Price.
2	2½ in.	6 in.	.26 gal.	2 in. hose.	1½ in. hose.	125 ft.	Defy	\$68.00	Delaine	\$90.00
4	3 " "	6 " "	.37 " "	2 " "	1½ " "	125 " "	Visipl	70.00	Visit	95.00
6	3½ " "	6 " "	.50 " "	2½ " "	1½ " "	100 " "	Deify	77.00	Delf	108.00
8	4 " "	6 " "	.65 " "	2½ " "	1½ " "	100 " "	Deign	85.00	Dell	125.00
10	4½ " "	6 " "	.83 " "	3 " "	2 " "	100 " "	Deist	100.00	Delve	145.00
12	5 " "	6 " "	1.02 " "	4 " "	3 " "	75 " "	Daygo	125.00	Daygul	180.00
16	6 " "	8 " "	1.96 " "	4 " "	3 " "	75 " "	Deity	140.00	Demi	200.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

## GOULDS TWO-CYLINDER FORCE PUMP.

OPEN TOP. WOOD LEVERS.



FIG. 518.

Fig. 518 is a powerful Two-Cylinder Force Pump, which is double-acting in operation, simple and compact in build, all parts being readily accessible, and can be operated by wood levers or power, as desired. The suction plate is always fitted for wrought-iron pipe, and the discharge opening has a brass tube for wiring on hose. Can fit both ends for wrought-iron pipe, or both ends for hose, if ordered.

FIG. 518. (WEDDING.) SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	*Lift and Force.	Iron Cyls.	Brass Lined Cyls.	Brass Cyls.
4	3 in.	6½ in.	.40 gal.	1½ in. pipe.	1½ in. hose.	100 ft.	\$40.00	\$48.00	\$65.00
6	3½ "	6½ "	.54 "	2 "	1½ "	75 "	45.00	57.00	78.00
8	4 "	8 "	.87 "	2½ "	2 "	75 "	55.00	70.00	95.00
10	4½ "	8 "	1.10 "	2½ "	2 "	75 "	67.00	86.00	115.00
12	5 "	8 "	1.36 "	2½ "	2 "	75 "	82.00	100.00	140.00
16	6 "	8 "	1.96 "	4 "	2½ "	50 "	110.00	140.00	170.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.

## GOULDS TWO-CYLINDER FORCE PUMP.

OPEN TOP. WROUGHT-IRON EXTENSION LEVERS.

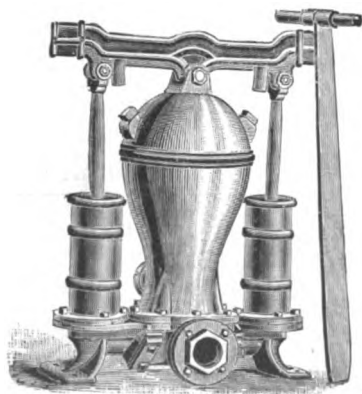


FIG. 520.

Fig. 520 represents our Two-Cylinder Suction and Force Pump described above arranged with wrought-iron extension levers. When these levers are put in place, they afford room for many men to work, and render this Pump a most powerful engine for forcing water on fires, or supplying it for many uses about factories, warehouses, wharves, etc.

FIG. 520. (WATERFL.) SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	*Lift and Force.	Iron Cyls.	Brass Lined Cyls.	Brass Cyls.
4	3 in.	6½ in.	.40 gal.	1½ in. pipe.	1½ in. hose.	100 ft.	\$50.00	\$58.00	\$75.00
6	3½ "	6½ "	.54 "	2 "	1½ "	75 "	55.00	67.00	88.00
8	4 "	8 "	.87 "	2½ "	2 "	75 "	65.00	80.00	105.00
10	4½ "	8 "	1.10 "	2½ "	2 "	75 "	77.00	96.00	125.00
12	5 "	8 "	1.36 "	2½ "	2 "	75 "	92.00	110.00	150.00
16	6 "	7 "	1.96 "	4 "	2½ "	50 "	120.00	150.00	180.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water.



# GOULDS SHIP'S MAIN AND BILGE PUMP.

WITH WOOD LEVERS.

The cut represents our improved Ship's Main and Bilge Pump for use upon ship-board, in mines, and upon plantations for irrigation. It has a reversible top, heavy strong bed plate, with brass valve seats cast in the base, poppet valves of new design; the suction pipe is attached to the vacuum chamber above the valves, so that they are always submerged; the plungers are always made of brass, with large waterways, and in Pumps with brass-lined cylinders we put brass valve seats. Always fitted for 3-inch wrought-iron suction pipe. We also furnish two and three way cocks, at extra list price. See under Fig. 579.

FIG. 578. SIZES, PRICES, ETC.

Dia. Cyls.	Stroke.	Capacity per Rev.	Suction.	Lift.	IRON CYLINDERS.		BRASS LINED CYLINDERS.	
					Cipher.	Price.	Cipher.	Price.
5½ in.	6½ in.	1.34 gal.	3 in. pipe.	25 ft.	Lestall	\$55.00	Lidda	\$75.00
5½ "	8 "	1.64 "	3 "	25 "	Letada	60.00	Lien	80.00
6 "	8 "	1.96 "	3 "	25 "	Levy	70.00	Maw	90.00

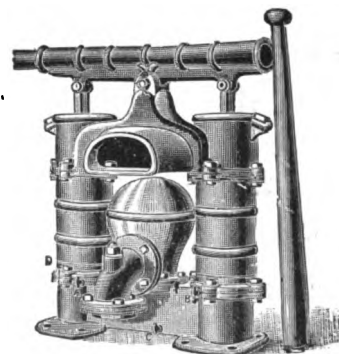


FIG. 578.

# GOULDS SHIP'S MAIN AND BILGE PUMP.

WITH WROUGHT-IRON EXTENSION LEVERS.

Fig. 579 represents our improved Ship's Main and Bilge Pump, fully described above, arranged with wrought-iron extension levers, so that a large force of men can be employed in operating it. We also furnish two and three turn brass cocks with elbows, where a suction pipe is wanted for each side of the keelson. Always fitted for 3-inch wrought-iron suction pipe.

FIG. 579. SIZES, PRICES, ETC.

Dia. Cyls.	Stroke.	Capacity per Rev.	Suction.	Lift.	IRON CYLINDERS.		BRASS LINED CYLINDERS.	
					Cipher.	Price.	Cipher.	Price.
5½ in.	6½ in.	1.34 gal.	3 in. pipe.	25 ft.	Maya	\$60.00	Meada	\$80.00
5½ "	8 "	1.64 "	3 "	25 "	Mazed	65.00	Meal	85.00
6 "	8 "	1.96 "	3 "	25 "	Mazy	75.00	Meaned	95.00
8 "	8 "	3.48 "	3 "	25 "	Mazera	135.00	Meant	160.00

Brass 2-way cock, with 2 elbows for 2 suction pipes . . . . . \$18.00 net.  
 Brass 3-way cock, with 3 elbows for 3 suction pipes . . . . . 20.00 net.

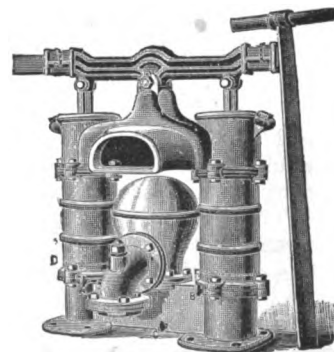


FIG. 579.

# GOULDS HAND AND POWER ROTARY FORCE PUMP.

PROBABLY in no class of manufacture is the axiom, "The best is the cheapest," better exemplified than in that of Hand and Power Rotary Force Pumps.

Having been extensively engaged for the past 35 years in the manufacture and sale of these Pumps, we have profited by our experience, and feel justified, by the unsolicited testimony of our patrons and our constantly increasing sales, in saying we are to-day making the largest and best line of these goods in the market. A Rotary Pump must be made with the utmost care and accuracy, or it is worthless — and it is these points of excellence, accomplished by our skilled labor and improved machinery, that have earned the enviable reputation of the "Goulds Rotary."

These Pumps will lift water as far as any piston Pump and give a constant uniform discharge.

When wanted for pumping hot liquids it is necessary that we should be advised of it, as we put in a metallic valve in that case. Bronze Pumps should always be used in distilleries, malt houses, etc.

The whole inside working and principle of our Pumps are obvious from the illustrations given below, in which **Fig. 299** represents the cams used in our smaller Hand Pumps, and **Fig. 300** those in our large Power Pumps.

VIEW OF GOULDS ROTARY PUMPS WITH CASE COVER REMOVED.

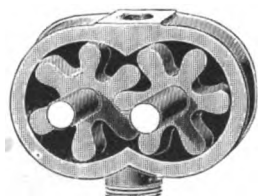


FIG. 299.

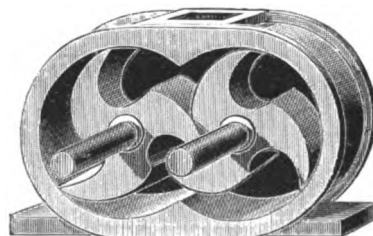


FIG. 300.

The peculiar formation of these revolving cams or pistons was acquired after long experimenting and successful practice, and has demonstrated them to be of such a shape as to produce the very minimum of friction and wear with the greatest results.

The cases which receive these cams are engine lathe turned and bored and so perfectly true and smooth that the cams when in operation create almost a perfect vacuum and will "pick up" water quicker, for a long distance, and hold it better than any other Pump. The cams are not rough castings, "sand ground," as those in some inferior Pumps, but are carefully and accurately planed to mesh into each other and fit their case perfectly.

It is also a point worth noting that if a little good oil be put into the case of our Pumps before and after using at first, or simply pump air with this oil a few times, the cams become as hard upon the surface as fine tempered steel, and are almost unaffected by constant use afterwards.

Drip plugs are provided for draining Pumps in cold weather. To do this, turn the cams backward a single revolution to release all water.

# GOULDS ROTARY FORCE PUMP.

WITH LIGHT BALANCE WHEEL, FOR MANUAL POWER.

**Fig. 297** represents one of our celebrated Hand Rotary Force Pumps. They are adapted for every place or purpose where a Lift and Force Pump can be used, and will pump from a well or cistern, or can be moved to any place where water is not more than 15 to 20 feet distance and operated instantly. They will pump hot water equally as well by the addition of a metallic lower valve. For wine or liquor a bronze Pump should always be used, as it is unaffected by the action of acids. *Our Rotary Pumps are known in every country of the world as the very best made, and always give satisfaction.*

**FIG. 297. SIZES, PRICES, ETC.**

No.	Capacity per Minute, 100 Rev.	Suction.	Discharge.	Dia. Balance Wheel.	* Lift and Force.	IRON.		† BRONZE.	
						Cipher.	Price.	Cipher.	Price.
1	13 gals.	1 1/4 in. pipe.	1 in. pipe.	14 1/2 in.	60 ft.	Ditty	\$19.00	Dizzy	\$41.00
2	14 "	1 1/4 "	1 "	14 1/2 "	60 "	Dive	22.00	Dock	46.00
3	17 "	1 1/2 "	1 1/4 "	14 1/2 "	60 "	Divan	26.00	Dodge	51.00

\* Total lift and force from supply to point of delivery, Pump not more than 15 to 20 feet above water.

† Bronze Pumps have bronze cases, cams and spouts.



**FIG. 297.**

# GOULDS LARGE ROTARY FORCE PUMP.

WITH HEAVY BALANCE WHEEL, FOR MANUAL POWER.

**Fig. 297 1/2** shows a Hand Rotary Pump of large capacity and power.

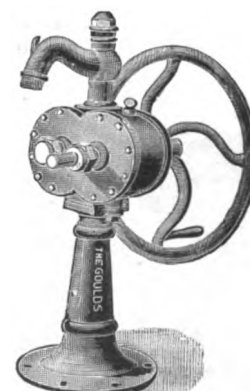
The cam shaft is long enough to put another fly-wheel on, so that four men can work if necessary. Brass plugs are provided at top and bottom of case for letting out the water in cold weather. After taking out the plugs reverse the cams two or three times around so as to get the water down from the top. We would advise the use of a check valve at end of suction pipe, as it keeps the pipe always filled and renders the Pump ready for use with a single revolution.

**FIG. 297 1/2. SIZES, PRICES, ETC.**

No.	Capacity per Minute, 100 Rev.	Suction.	Discharge.	Dia. Balance Wheel.	* Lift and Force.	IRON.		† BRONZE.	
						Cipher.	Price.	Cipher.	Price.
1	13 gals.	1 1/4 in. pipe.	1 in. pipe.	20 in.	60 ft.	Doer	\$20.00	Doled	\$42.00
2	14 "	1 1/4 "	1 "	20 "	60 "	Doff	23.00	Domel	47.00
3	17 "	1 1/2 "	1 1/4 "	20 "	60 "	Doggel	27.00	Donad	52.00
4	27 "	1 1/2 "	1 1/4 "	20 "	60 "	Dogma	35.00	Done	65.00
4A	27 "	1 1/2 "	1 1/2 "	36 "	60 "	Dogskin	39.00	Doit	69.00
5	36 "	2 "	2 "	36 "	60 "	Doing	40.00	Docm	75.00
5A	36 "	2 "	2 "	36 "	60 "	Doily	44.00	Dolce	79.00
6	45 "	2 "	2 "	36 "	60 "	Doidness	50.00	Doiture	100.00

\* Total lift and force from supply to point of delivery, Pump not more than 15 to 20 feet above water.

† Bronze Pumps have bronze cases, cams and spouts.



**FIG. 297 1/2.**

# GOULDS ROTARY FORCE PUMP.

ARRANGED WITH SIDE SUCTION, FOR MANUAL POWER.

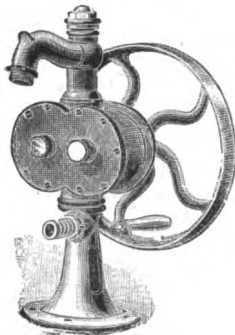


FIG. 821

Fig. 821 represents our Hand Rotary Force Pump arranged with side suction for hose or lead pipe. Unlike other Rotary Pumps, which are tapped for wrought-iron pipe that must pass up through bottom of standard or base, this one is conveniently arranged for hose suction at side. Many reasons will suggest themselves of the practical utility and convenience of this feature, as the suction hose may be dropped in any position readily, and as readily removed to another for immediate use.

FIG. 821. SIZES, PRICES, ETC.

No.	Capacity per Min., 100 Revs.	Suction.	Discharge.	Dia. Balance Wheel.	* Lift and Force.	IRON.		BRONZE.	
						Cipher.	Price.	Cipher.	Price.
1	13 gals.	1 1/4 in. pipe.	1 in. pipe.	14 1/2 in.	60 ft.	Watest	\$20.00	Wateyf	\$42.00
2	14 "	1 1/4 "	1 "	14 1/2 "	60 "	Wateta	23.00	Watfat	47.00
3	17 "	1 1/2 "	1 1/4 "	14 1/2 "	60 "	Wateub	27.25	Watfeg	52.25
4	27 "	1 1/2 "	1 1/2 "	20 "	60 "	Watevs	36.25	Watgan	66.25
5	35 "	2 "	2 "	20 "	60 "	Watewd	41.75	Watges	76.75
6	45 "	2 "	2 "	35 "	60 "	Watexr	51.75	Wathot	101.75

\* Total lift and force from supply to point of delivery, Pump not more than 20 feet above water.

# GOULDS ROTARY FORCE PUMP.

WITH OUTSIDE BEARING AND PULLEY FLY-WHEEL FOR POWER.

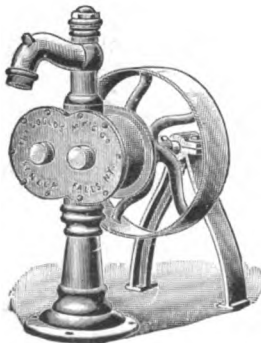


FIG. 819

Fig. 819 represents our Rotary Force Pump with outside bearing and pulley fly-wheel for power use. This Pump may be used for any of the many services of Rotaries — for pumping hot or cold water, wines, liquors, etc., and is specially arranged for power use at a moderate expense. These Pumps are admirably adapted for use with high speed gas, kerosene, or other engines, as the height of outside bearing admits of the use of a very large pulley to compensate for speed of engine.

Always fitted for wrought-iron suction pipe.

FIG. 819. SIZES, PRICES, ETC.

No.	Capacity per Min., 100 Revs.	Suction.	Discharge.	Pulley.	* Lift and Force.	IRON.		BRONZE.	
						Cipher.	Price.	Cipher.	Price.
1	13 gals.	1 1/4 in. pipe.	1 in. pipe.	18 x 4 in.	60 ft.	Vaguene	\$25.00	Vahepa	\$47.00
2	14 "	1 1/4 "	1 "	18 x 4 "	60 "	Vahab	28.00	Vaheqt	52.00
3	17 "	1 1/2 "	1 1/4 "	18 x 4 "	60 "	Vahela	32.00	Vaherls	57.00
4	27 "	1 1/2 "	1 1/2 "	35 x 4 "	60 "	Vahemy	45.00	Vahesm	75.00
5	35 "	2 "	2 "	35 x 4 "	60 "	Vaheni	50.00	Vaheta	85.00
6	45 "	2 "	2 "	35 x 4 "	60 "	Vaheop	60.00	Vaheub	110.00

\* Total lift and force from supply to point of delivery, Pump not more than 20 feet above water.

# GOULDS ROTARY BARREL FORCE PUMP.

WITH IMPROVED BARREL ATTACHMENT, OR HOLDER.

The cut shows our Hand Rotary Pumps arranged with an improvement for holding the suction pipe of the Pump rigid in the bung of a barrel. The holder is a tapering sleeve in two halves, and can be used in barrels having any size of bung, from 1½ to 4 inches in diameter. A suction pipe of three feet in length is furnished with each Pump as well as a hose coupling. With this apparatus, fluids of any character or consistency can be pumped from a barrel, tierce or hogshhead, and forced into a reservoir or receptacle at any distance removed.

The prices given below include suction pipe, hose coupling, hook and holder.

FIG. 464. SIZES, PRICES, ETC.

No.	Capacity per Minute, 100 Revs.	Suction.	Discharge.	* Lift and Force.	IRON.		† BRONZE.	
					Cipher.	Price.	Cipher.	Price.
1	13 gals.	1 in. pipe.	1 in. hose.	60 ft.	Girth	\$17.00	Glade	\$39.00
2	14 "	1 "	1 "	60 "	Gist	20.00	Glared	44.00
3	17 "	1½ "	1½ "	60 "	Give	24.00	Glass	49.00

\* Total lift and force from supply to point of delivery, Pump not more than 20 feet above water.

† Bronze Pumps have bronze cases, cams and spouts.

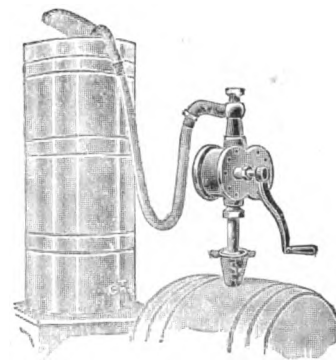


FIG. 464.

## SPECIAL ROTARY FORCE PUMP.

WITH BRACKET FOR ATTACHING TO MACHINES.

Fig. 944 is a special pattern Rotary Force Pump designed to pump small quantities of oil to pipe-cutting and threading machines, bolt cutters, etc., or return this oil to reservoir from which supply is taken to machines.

Pump has bracket for fastening to machines and shaft long enough to receive pulley.

While Pump will specially recommend itself to machine builders, manufacturers of bolts, screws, etc., yet it may be employed for any service where a small compact Force Pump is required.

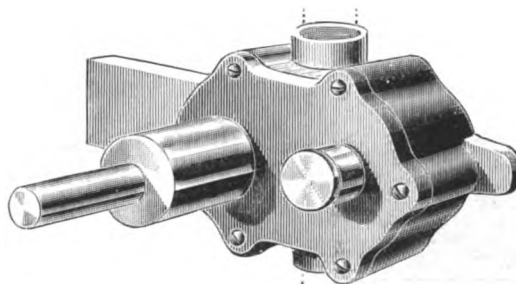


FIG. 944.

No.	Capacity per Minute, 100 Revs.	Suction.	Discharge.	* Lift and Force.	IRON.		† BRONZE.	
					Cipher.	Price.	Cipher.	Price.
0	1 gal.	½ in. pipe.	½ in. pipe.	100 ft.	Awning	\$15.00	Calmed	\$25.00

\* Total lift and force from supply to point of delivery, Pump not more than 20 feet above liquid.

† Bronze Pumps have bronze cases, cams and spouts.

# GOULDS ROTARY FORCE PUMP.

WITH LIGHT BALANCE WHEEL FOR MANUAL POWER.



FIG. 665.

The cut shows one of our celebrated Hand Rotary Force Pumps, arranged on a flat base or plate, 7 x 10 inches, with a cast-iron hub projecting four or five inches below it.

We always fit both suction and discharge for hose coupling unless otherwise ordered, but can fit them also for gas pipe if so advised.

FIG. 665. SIZES, PRICES, ETC.

No.	Capacity per Min., 100 Revs.	Suction.	Discharge.	Dia. Balance Wheel.	IRON.		† BRONZE.	
					Cipher.	Price.	Cipher.	Price.
1	13 gals.	1 1/4 in. pipe.	1 in. pipe.	14 1/2 in.	Louck	\$19.50	Lung	\$41.50
2	14 "	1 1/4 "	1 "	14 1/2 "	Luff	22.50	Lured	46.50
3	17 "	1 1/2 "	1 1/4 "	14 1/2 "	Luke	26.75	Lush	51.75
4	27 "	1 1/2 "	1 1/2 "	20 "	Lull	36.50	Lute	67.00
5	36 "	2 "	2 "	20 "	Lump	42.00	Mace	77.50

† Bronze Pumps have bronze cases, cams and spouts.

# GOULDS POWER ROTARY FORCE PUMP.

ON FRAME, WITH TIGHT AND LOOSE PULLEYS.

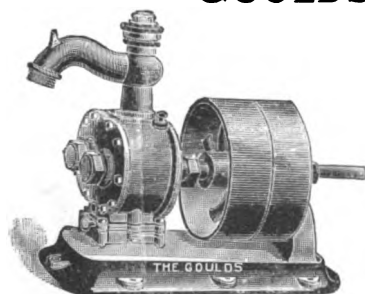


FIG. 253.

This cut accurately represents our Rotary Force Pump on heavy cast-iron frame, with tight and loose pulleys for power. Its internal construction is exactly similar to that of Figs. 297 and 297 1-2, previously described, and arranged this way it is capable of constant and productive work. Beyond the pulleys is a strong bearing with Babbitt-lined boxes in which the driving shaft runs. The shaft is also made long enough to take a balance wheel beyond the bearing, but this wheel is only furnished at extra price.

This pump will be found serviceable for furnishing considerable volume of water under low pressure. Its adaptations, etc., are given in our table below.

FIG. 298. SIZES, PRICES, ETC.

No.	Capacity per Min., 100 Revs.	Suction.	Discharge.	Pulleys, Each.	* Lift and Force.	IRON.		† BRONZE.	
						Cipher.	Price.	Cipher.	Price.
1	13 gals.	1 1/4 in. pipe.	1 in. pipe.	8 x 2 1/2 in.	60 ft.	Dorel	\$27.00	Doth	\$49.00
2	14 "	1 1/4 "	1 "	8 x 2 1/2 "	60 "	Doric	32.00	Doubt	56.00
3	17 "	1 1/2 "	1 1/4 "	8 x 2 1/2 "	60 "	Doses	38.00	Dough	63.00
4	27 "	2 "	1 1/2 "	12 x 3 1/2 "	60 "	Dotad	48.00	Douse	78.00
5	36 "	2 "	2 "	12 x 3 1/2 "	60 "	Doteb	54.00	Dove	90.00
6	45 "	2 1/2 "	2 1/2 "	24 x 4 "	60 "	Weigky	80.00	Wheerin	135.00

\* Total lift and force from supply to point of delivery, Pump not more than 20 feet above water.

† Bronze Pumps have bronze cases, cams and spouts.

# SEMI-ROTARY "CLOCK" FORCE PUMP.

DOUBLE-ACTING, WITH REMOVABLE LEVER.

Fig. 965 represents our Semi-Rotary "Clock" Force Pump, arranged with removable wood lever.

Working parts of Pump comprise brass double wing, oscillating piston with brass valves, on each side of wing, encased in cylinder. The lever is attached to shaft or piston rod, and the water way of each set of valves is separated from the other in the suction valve box. These Pumps are practically metallic fitted, and having no leather packing, may be employed in pumping hot liquids, oil, wine, etc.

In our brass fitted Pumps, all working parts are brass except cylinder case and cover; in Brass Pumps, all working parts are made of this metal.

FIG. 965. SIZES, PRICES, ETC.

No.	Approximate Capacity per Minute.	Suction.	Discharge.	* Lift and Force.	BRASS FITTED.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
1	4 gals.	$\frac{1}{2}$ in. pipe.	$\frac{1}{2}$ in. pipe.	150 ft.	Wordym	\$5.00	Worldly	\$7.00
2	5 "	$\frac{3}{4}$ "	$\frac{3}{4}$ "	150 "	Worec	6.00	Worm	9.00
3	6 "	1 "	1 "	125 "	Work	7.25	Wormal	12.50
4	9 "	$1\frac{1}{4}$ "	$1\frac{1}{4}$ "	125 "	Worker	9.00	Wormy	15.00
5	13 "	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "	100 "	Workin	10.00	Wornl	18.75
6	19 "	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "	100 "	World	12.00	Wornie	21.25

\* Total lift and force from supply to point of delivery, Pump not more than 15 to 20 feet above water.

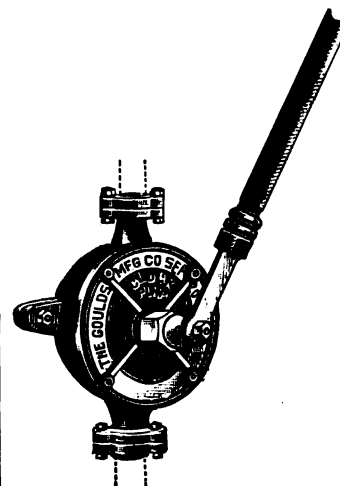


FIG. 965.

# SEMI-ROTARY "CLOCK" FORCE PUMP.

DOUBLE-ACTING, ON BASE.

Fig. 982 represents our celebrated Semi-Rotary "Clock" Pump arranged on a base or standard,

This base is detachable and the Pump can either be used with the base, or can be bolted to a plank or the side of wall, as desired. These Pumps are practically metallic fitted, and may be employed for pumping hot liquids, oil, etc. Suction and discharge always fitted for wrought-iron pipe unless otherwise ordered. When fitted for lead pipe or hose an extra charge will be made.

FIG. 982. SIZES, PRICES, ETC.

No.	Capacity per Min.	Suction.	Discharge.	* Lift and Force.	BRASS FITTED.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
1	4 gals.	$\frac{1}{2}$ in. pipe.	$\frac{1}{2}$ in. pipe.	150 ft.	Wronga	\$6.00	Zylop	\$8.00
2	5 "	$\frac{3}{4}$ "	$\frac{3}{4}$ "	150 "	Wronger	7.25	Zylopel	10.50
3	6 "	1 "	1 "	125 "	Wrongfu	8.75	Zylopa	13.50
4	9 "	$1\frac{1}{4}$ "	$1\frac{1}{4}$ "	125 "	Wrongly	11.00	Zylopdq	17.50
5	13 "	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "	100 "	Wrongne	12.50	Zylora	21.50
6	19 "	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "	100 "	Wrongou	15.00	Zylored	25.00

\* Total lift and force from supply to point of delivery, Pump not more than 15 to 20 feet above water.

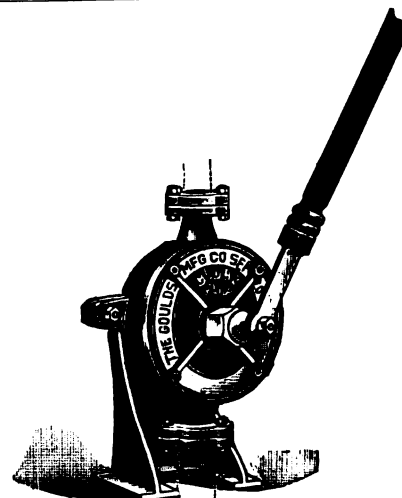


FIG. 982.

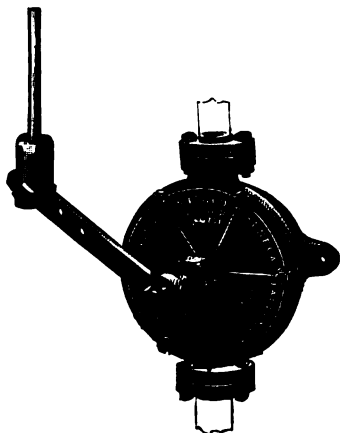


FIG. 998.

## SEMI-ROTARY "CLOCK" FORCE PUMP.

WITH FORKED WELDING STUB FOR WINDMILL OR OTHER POWER CONNECTION.

Fig. 998 represents our Semi-Rotary Double-Acting Force Pump, arranged with removable lever and forked welding stub for Wind Mill or other power connection.

Briefly described, the working parts of Pump comprise brass double wing oscillating piston, with brass valve on each side of wing, incased in cylinder; the lever, which may be worked from either vertical or horizontal position, is attached to shaft or piston rod, and the water way of each set of valves is separated from the other in the suction valve box. These Pumps are practically metallic fitted, and having no leather packing they may be employed for pumping hot liquids, oil, wine, etc.

In our Brass Fitted Pumps all working parts are brass, except cylinder case and cover; in Brass Pumps all working parts are made of this metal.

FIG. 998. SIZES, PRICES, ETC.

No.	Approx. Capacity per Min.	Suction.	Discharge.	* Lift and Force.	BRASS FITTED.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
4	6 gals.	1 in. pipe.	1 in. pipe.	125 ft.	Zutend	\$10.50	Zutenus	\$16.50
5	9 "	1 1/4 " "	1 1/4 " "	125 "	Zutenel	11.50	Zutea	20.25
6	13 "	1 1/2 " "	1 1/2 " "	100 "	Zutenod	13.50	Zuteous	22.75

\* Depth of wells to which Pumps may be adapted by lowering Cylinders within 15 or 20 feet of water, to total lift and force from supply to point of delivery.



FIG. 995.

## SEMI-ROTARY "CLOCK" FORCE PUMP.

DOUBLE ACTING, WITH AIR CHAMBER AND COCK.

Fig. 995 represents our "Clock" Pump, mounted on iron standard, with air chamber and cock spout. So arranged, these Pumps may be used for drawing water at the spout, or for forcing the water above the Pump to tanks, bath-rooms etc. Having metal valves, they may be employed for pumping hot liquids, oil, etc. Suction and discharge always fitted for wrought-iron pipe unless otherwise ordered. When fitted for lead pipe or hose an extra charge will be made.

FIG. 995. SIZES, PRICES, ETC.

No.	Approx. Capacity per Min.	Suction.	Discharge.	* Lift and Force.	BRASS FITTED.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
1	4 gals.	1/2 in. pipe.	1/2 in. pipe.	150 ft.	Zutela	\$10.00	Zutelop	\$12.00
2	5 "	3/4 " "	3/4 " "	150 "	Zuteled	11.00	Zutelny	14.00
3	6 "	1 " "	1 " "	125 "	Zylonp	12.50	Zyma	17.50
4	9 "	1 1/4 " "	1 1/4 " "	125 "	Zylonti	15.00	Zym	21.50
5	13 "	1 1/2 " "	1 1/2 " "	100 "	Zyloo	18.50	Zymad	27.50
6	19 "	1 3/4 " "	1 3/4 " "	100 "	Zyloosd	22.50	Zymeg	32.50

\* Total lift and force from supply to point of delivery, Pump not more than 15 to 20 feet above water.



## GOULDS POWER ROTARY PUMP.

Our Power Rotary Pump has certain characteristics of the Triplex Power Pump. It has the triplex, or three-toed cam, which insures a full continuous intake and delivery and operation with a minimum of power. A Pump of this type has remarkably great capacity, considering its dimensions, and its capacity increases or decreases in proportion to increase or decrease of speed. It handles liquids of any kind, hot or cold, thick or thin. For fire protection, pumping for manufacturing and other purposes, our Rotary Pump possesses a long established reputation for durability, good workmanship and general excellence.

All our Pumps of this class have the working parts mounted on heavy cast-iron bed, which preserves perfect alignment of the bearings and cams. The two shafts are geared together at both ends of the Pump. The gears are machine-cut and protected by guard covers. The four main bearings are of extra length and lined with Babbitt metal.

The stuffing boxes are quickly accessible and easily repacked. The case, or cylinder, is accurately bored and finished in the best manner possible. The cams are finished to run together with great precision.

Suction connection is made within the bed-plate directly beneath the case and is regularly fitted for wrought-iron pipe; fitted for cast-iron pipe or hose if so ordered. The discharge piece is bolted directly to top of case; it is made in various forms and has outlets as required for the intended service.

The outlet flanges are interchangeable. Same general directions (see page 185) which apply to the placing and piping of other Power Pumps apply to the Rotary. The larger Rotary Pumps require a good strong foundation. Plans will be made and furnished to order.

There is a priming plug in the discharge piece and a drip plug in the inlet.

When the Pump is used intermittently, it should be freed of water when stopped and some oil introduced at the priming plug. Turning the Pump a few times will effectively spread the oil over the cams and the case and thus corrosion will be prevented.

Our Rotary Pumps should be driven so that the gear teeth run toward each other at the top. The driving connection may be made at either end of the Pump. The proper direction of rotation of the Pump can be had regardless of the direction of rotation of the driving shaft, because the rotation of the Pump is reversed by turning the Pump end to end on the foundation. The following pages describe a few of our Rotary Pumps as adapted for various kinds of pumping.

# GOULDS POWER ROTARY FORCE PUMP.

WITH TIGHT AND LOOSE PULLEYS FOR BELT.

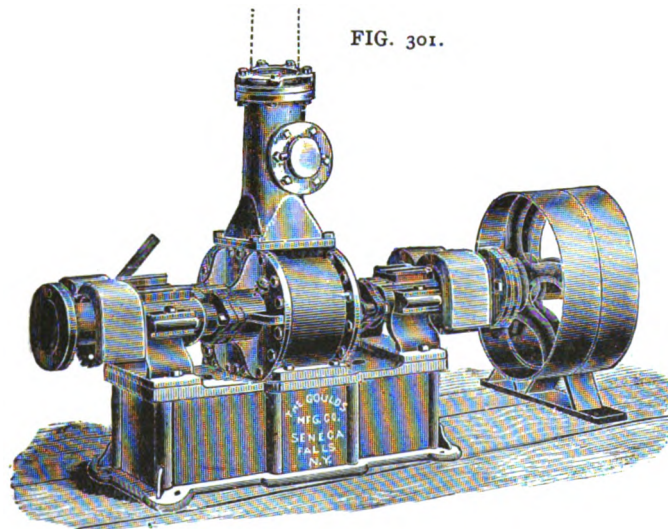


FIG. 301.

Fig. 301, Power Rotary Force Pump, is designed for water supply, tank service, circulating liquids of any kind, pumping oil, etc. It has tight and loose pulleys. Sizes Nos. 1, 2 and 3 have shaft extended to carry the pulleys, which will be placed at either end of the Pump, as ordered. Nos. 4, 5 and 6 have pulleys mounted on short piece of shaft and connected to cam shaft by flange coupling, which may be attached at either end of Pump. All sizes have out-board bearing for pulleys. Pulleys are regularly attached as shown in illustration. There are two outlets on all sizes of Pumps.

No. 1 has side outlet furnished with  $1\frac{1}{2}$ -inch brass hose nipple and cap; top outlet threaded for  $1\frac{1}{2}$ -inch wrought-iron pipe. No. 2 has 2-inch out-

lets fitted like No. 1. The larger sizes have side outlet threaded for  $2\frac{1}{2}$ -inch hose coupling and furnished with cap; the top outlet is threaded for wrought-iron pipe of sizes given in table below. The suction is regularly fitted for wrought-iron pipe; fitted for cast-iron pipe or hose to order.

FIG. 301. SIZES, PRICES, ETC.

No.	Capacity One Rev.	† Speed and Capacity per Min., varying with Kind of Work and Pressure.	Suction.	Discharge.	Pulleys, Each.	IRON.		BRONZE.	
						Cipher.	Price.	Cipher.	Price.
1	$\frac{1}{4}$ gal.	100 to 250 revs. — 25 to 60 gals.	2 in. pipe.	$1\frac{1}{2}$ in. pipe.	12 x $3\frac{1}{2}$ in.	Dowdy	\$110.00	Dorad	\$170.00
2	$\frac{1}{2}$ "	100 to 200 " — 50 to 100 "	$2\frac{1}{2}$ "	2 "	16 x 4 "	Down	125.00	Dozer	190.00
3	1 "	100 to 175 " — 100 to 175 "	3 "	$2\frac{1}{2}$ "	18 x 5 "	Dowry	172.00	Dozy	272.00
4	$1\frac{1}{2}$ "	100 to 150 " — 165 to 250 "	5 "	4 "	24 x 6 "	Wealth	240.00	Weanac	340.00
5	$2\frac{1}{2}$ "	75 to 125 " — 185 to 310 "	6 "	5 "	30 x 8 "	Wean	300.00	Weanel	425.00
6	4 "	60 to 100 " — 240 to 400 "	8 "	6 "	36 x 10 "	Bandage	450.00	Basal	625.00

† Speeds given are a fair rate for continuous running; can be doubled for occasional service. Pumps are strong enough to force against about 100 pounds pressure.

# GOULDS POWER ROTARY FORCE PUMP.

ON FRAME, WITH COUPLINGS ON EACH END OF DRIVING SHAFT.

This cut represents another of our Power Rotary Force Pumps as we build them in the larger sizes, mounted on frame, with two heavy sets cut gears and coupling on each end of driving shaft for power connection. For large Power Force Pumps or Fire Pumps, we would always recommend the use of gears, with direct shaft connection, over that of belt power, as there is less liability of accident.

No. 1 has side outlet furnished with 1½-inch brass hose nipple and cap; top outlet threaded for 1½-inch wrought-iron pipe. No. 2 has 2-inch outlets, fitted like No. 1. The larger sizes have side outlet threaded for 2½-inch hose coupling and furnished with cap. The top outlet is threaded for wrought-iron pipe of sizes given in table below. The suction is regularly fitted for wrought-iron pipe; fitted for cast-iron pipe or hose to order.

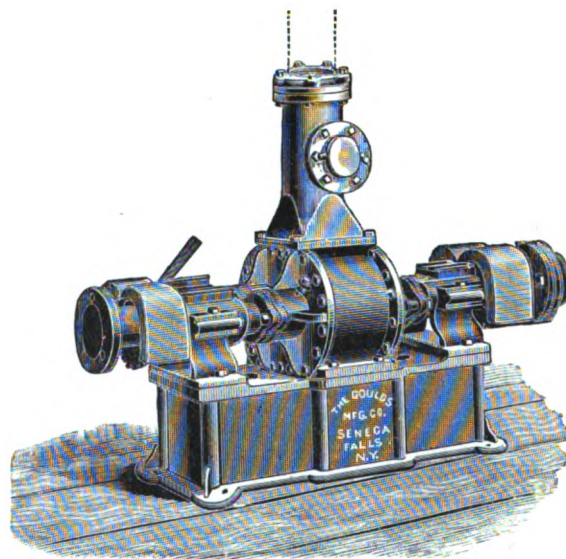


FIG. 302.

FIG. 302. SIZES, PRICES, ETC.

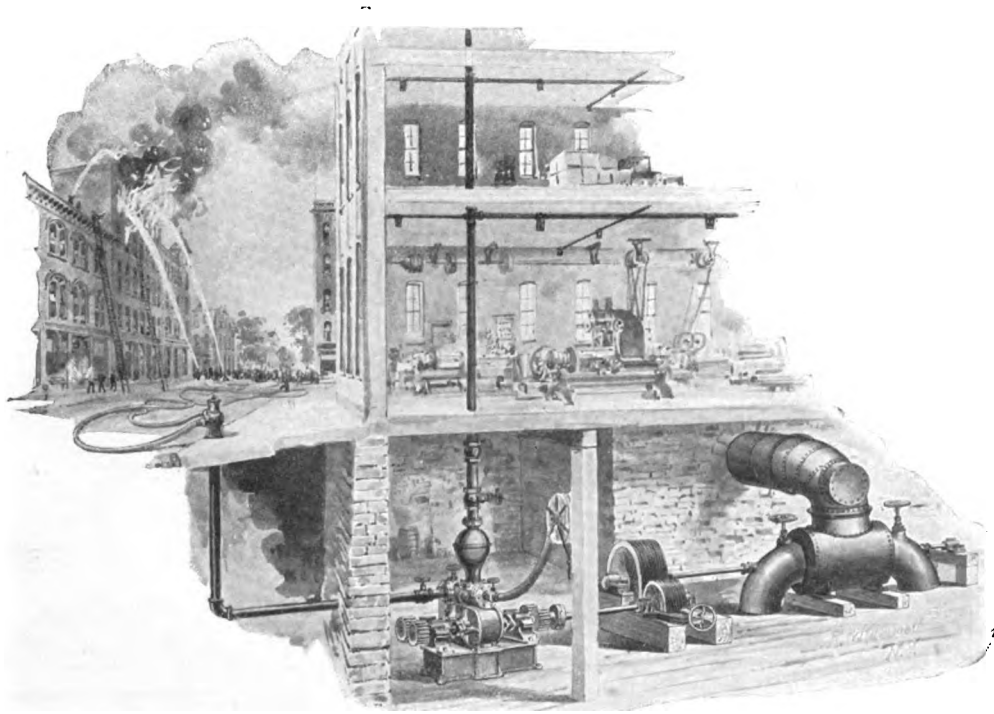
Size.	Capacity one Revolution.	†Speed and Capacity per Minute, varying with Kind of Work and Pressure.	Suction.	Discharge.	IRON.		BRONZE.	
					Cipher.	Price.	Cipher.	Price.
No. 1	¼ gal.	100 to 250 revs., 25 to 60 gals.	2 in. pipe.	1½ in. pipe.	Draft	\$100.00	Weaning	\$160.00
" 2	½ "	100 " 200 " 50 " 100 "	2½ "	2 "	Drag	115.00	Weapon	180.00
" 3	1 "	100 " 175 " 100 " 175 "	3 "	2½ "	Drain	160.00	Wear	260.00
" 4	1½ "	100 " 150 " 165 " 250 "	5 "	4 "	Drake	225.00	Wearda	325.00
" 5	2½ "	75 " 125 " 185 " 310 "	6 "	5 "	Dram	275.00	Wearer	400.00
" 6	4 "	60 " 100 " 240 " 400 "	8 "	6 "	Dripom	425.00	Wearfu	600.00

†Speeds given are a fair rate for continuous running; can be doubled for occasional service. Pumps are strong enough to force against about 100 pounds pressure.

See pages 309 and 310 for prices, Pipes, Hose, Couplings, Play Pipes, etc.

# GOULDS POWER ROTARY FIRE PUMP.

WITH FRICTIONAL GEARING.



We illustrate in operation a most satisfactory plan of driving our Power Rotary Fire Pump, either in connection with or independent of other machinery. Power is transmitted without intermediate gearing, by direct shaft connections from horizontal turbine wheel to friction pulley driving Pump, to turned pulley beyond (not shown in plan), driving other machinery. The advantages of this plan are, Pump may be started and stopped while wheel and machinery are running at full speed, by turn-

ing hand wheel and moving receiving friction pulley against driving friction pulley, and in the same manner the drive pulley driving machinery may be cut out and stopped by means of clutch coupling, thus avoiding the danger of stoppage, falling timbers, etc., on shop shafting and transferring entire power of wheel to Pump. A system of stand pipes with openings on each floor above, in connection with automatic sprinklers, completes a most perfect construction.

# GOULDS POWER ROTARY FIRE PUMP.

WITH COUPLING FOR DRIVING SHAFT.

Fig. 302½ is a powerful Fire Pump, durable and simple, having only two moving parts in the case (or cylinder). The method of driving shown in Fig. 895 (page 173) is excellent.

The suction is regularly fitted for wrought-iron pipe. It will be fitted for cast-iron pipe and hose when so ordered. There are five discharge openings on all Pumps. One is furnished with 2½-inch hose coupling and cap; one threaded for wrought-iron pipe of size stated in table below; the other outlets are provided with blank flanges. These outlets will be fitted otherwise to order.

An automatic relief valve should be attached close to the Pump. Either the spring or lever style may be used; general preference is for the spring valve. We are prepared to furnish both at market rates.

Valves for the several sizes should be: for No. 3 Pump, 2½-inch; No. 4 Pump, 3-inch; No. 5 Pump, 3½-inch; No. 6 Pump, 4-inch.

See "NOTES ON FIRE STREAMS," pages 174 and 175.

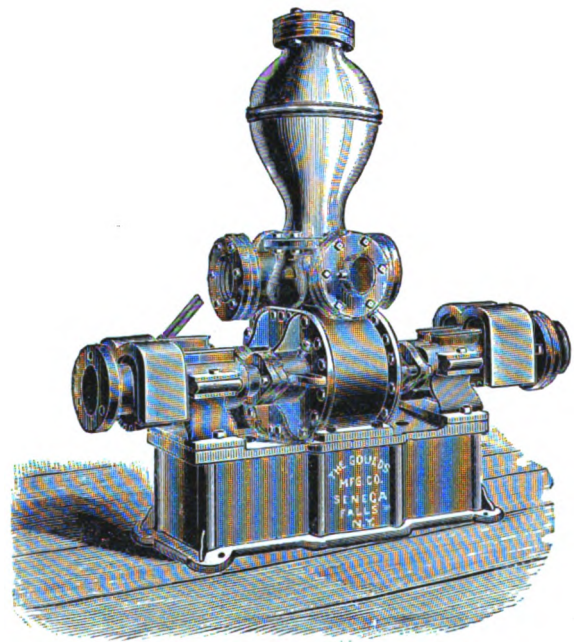


FIG. 302½.

## FIG. 302½. SIZES, PRICES, ETC.

No.	Capacity One Rev.	Speed and Capacity per Minute for Good Fire Service.	Number of Fire Streams.	Suction.	Discharge.	Cipher.	Price.
3	1 gal.	350 to 400 revs. — 350 to 400 gals.	See Tables	3 in. pipe.	2½ in. pipe.	Dregs	\$172.00
4	1½ "	300 to 350 " — 500 to 580 "	Pages	5 " "	4 " "	Dress	240.00
5	2½ "	250 to 300 " — 625 to 750 "	174 and 175.	6 " "	5 " "	Drift	300.00
6	4 "	200 to 250 " — 800 to 1000 "		8 " "	6 " "	Bearish	450.00

See pages 309 and 310 for prices, Pipe, Hose Couplings, Play Pipes, etc.

# GOULDS POWER ROTARY FIRE PUMP.

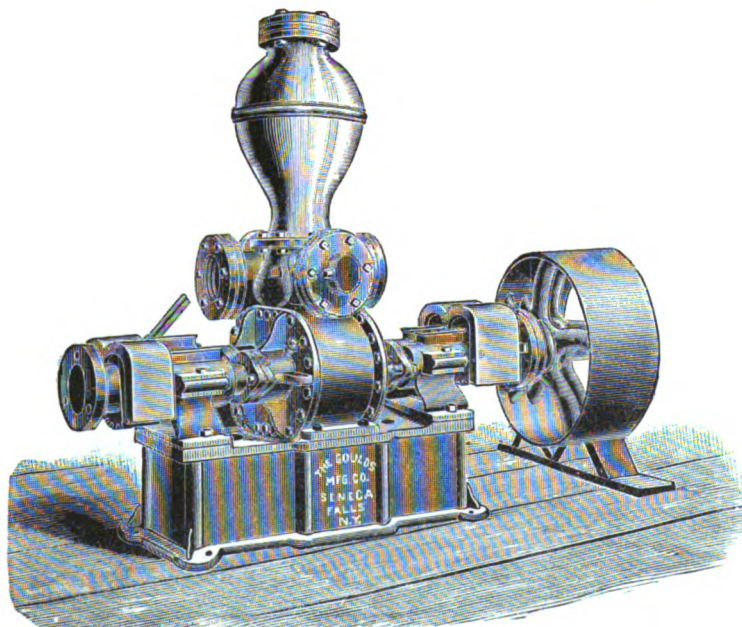


FIG. 896.

Fig. 896 represents our Power Rotary Fire Pump, surmounted with air chamber and Safety Valve, with outside bearings and one wide pulley for belt power. This manner of transmitting power may be preferable, or more available, in some places, and if necessary or desirable to secure protected position, driving shaft may be extended any distance, and outside bearing with pulley located at end. Flanged Coupling is interchangeable at either end, thus readily adapting Pumps for any place or position.

The suction is regularly fitted for wrought-iron pipe. It will be fitted for cast-iron pipe and hose when so ordered. There are five discharge openings on all Pumps. One is furnished with 2½-inch hose coupling and cap; one threaded for wrought-iron pipe of size stated in table below; the other outlets are provided with blank flanges. These outlets will be fitted otherwise to order.

See our remarks under Fig. 302½ (page 171) concerning water relief valve to be used with this Pump.

FIG. 896. SIZES, PRICES, ETC.

Size.	Capacity, one Revolution.	Speed and Capacity per Minute, for Good Fire Service.	Number of Fire Streams.	Suction.	Discharge.	Cipher.	Price.
No. 3	1 gal.	350 to 400 revs. — 350 to 400 gals.	See the Tables on pages 174 and 175.	3 in. pipe.	2½ in. pipe.	Weald	\$182.00
" 4	1½ "	300 to 350 " — 500 to 580 "		5 "	4 "	Wealden	252.00
" 5	2½ "	250 to 300 " — 625 to 750 "		6 "	5 "	Wealdis	315.00
" 6	4 "	200 to 250 " — 800 to 1000 "		8 "	6 "	Wealar	475.00

See pages 309 and 310 for Prices, Pipe, Hose, Couplings, Play Pipes, etc.



# GOULDS POWER ROTARY FIRE PUMP.

WITH FRICTIONAL GEARING.

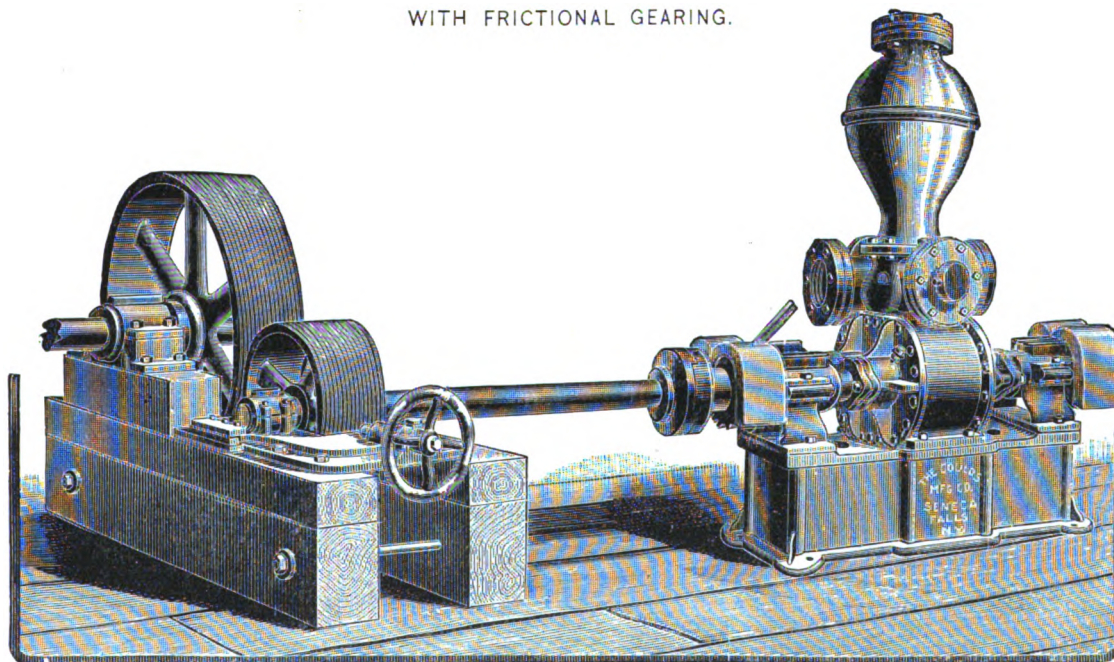


FIG. 895.

**Fig. 895, Power Rotary Fire Pump,** is arranged with frictional gearing. It is a method of driving acceptable to the Fire Underwriters, and is generally specified by them. Friction gears are a special form of pulley with faces cut to V-shaped grooves accurately fitted to mesh together. They have great traction, or transmitting, power and with but relatively little thrust on the bearings.

Rotary Fire Pumps are more commonly found in mills having water power, yet the Rotary Pump is often placed in mills and factories having steam power only. We have in our own works a 1,000 gallon Rotary Fire Pump coupled to a steam engine. This equipment is satisfactory to and has been accepted by the Associated Factory Mutual Insurance Companies.

Prices upon complete outfit with any method of driving will be quoted upon application. The following data is necessary: quantity of water required per minute; elevation above the Pump to highest point to be covered by fire stream; distance from Pump to remotest points to be protected; diameter and speed of the shaft available for driving the Pump; a sketch showing where the Pump is to be placed, the driving shaft and immediate surroundings.

We refer to opposite page for further description and to pages 174 and 175 for information about Fire Streams, etc.

## NOTES ON FIRE STREAMS.

The heights and distances given for good "effective fire streams" are with moderate wind. Maximum vertical height reached by the spray, or drops, in still air, is from 22 per cent., for the lower pressures, to 56 per cent., for the higher pressures, higher than the elevations given in the table. Maximum horizontal distance reached by the spray, or drops, in still air, is about 120 per cent., for the lower pressures, and 150 per cent., for the higher, further than the distance given in the table.

When "unlined linen hose" is used, the friction, or pressure, loss is from 8 to 50 per cent., increasing with the pressure. This kind of hose is best for inside use in short lengths. "Mill hose" is better than unlined linen hose for long lengths, but the "ordinary best quality" smooth, rubber lined hose is far superior to the "mill hose," having still less frictional resistance.

The "ring" nozzle is inferior to the "smooth" nozzle and actually delivers less water than the smooth. For instance, a  $\frac{7}{8}$ -inch "ring" nozzle discharges the same quantity of water as a  $\frac{3}{4}$ -inch "smooth," and a 1-inch "ring" nozzle the same as a  $\frac{7}{8}$ -inch "smooth."

Use double lines of hose and a Siamese nozzle for long distances and a hot fire. A double line a thousand feet long delivers a  $1\frac{1}{4}$ -inch stream with the same force as a single line 287 feet long. Small streams are all right for small fires, but for large, hot fires, use a  $1\frac{1}{4}$ -inch or  $1\frac{3}{4}$ -inch stream. Such a stream will always make a black mark wherever it hits, and the stream which hits and cools the



burning coals is the "effective fire stream." Small streams are converted into steam before touching the coals.

Two hundred and fifty gallons per minute is a good standard fire stream with 80 pounds pressure at the hydrant; 100 pounds pressure should not be exceeded, except for very high buildings, or lengths of hose exceeding 300 feet.

### TABLE OF EFFECTIVE FIRE STREAMS.

USING 100 FEET OF 2½-INCH ORDINARY BEST QUALITY RUBBER LINED HOSE BETWEEN NOZZLE AND HYDRANT, OR PUMP.

Smooth Nozzle, Size . . . . .	¾-inch.						¾-inch.						1-inch.					
Pressure at Hydrant, lbs. . . .	32	43	54	65	75	86	34	46	57	69	80	91	37	50	62	75	87	100
Pressure at Nozzle, lbs. . . .	30	40	50	60	70	80	30	40	50	60	70	80	30	40	50	60	70	80
Pressure lost in 100 ft., 2½-in. hose, lbs. . . . .	2	3	4	5	5	6	4	6	7	9	10	11	7	10	12	15	17	20
Vertical Height, ft. . . . .	48	60	67	72	76	79	49	62	71	77	81	85	51	64	73	79	85	89
Horizontal Distance, ft. . . .	37	44	50	54	58	62	42	49	55	61	66	70	47	55	61	67	72	76
Gals. Discharged per minute .	90	104	116	127	137	147	123	142	159	174	188	201	161	186	208	228	246	263

Smooth Nozzle, Size . . . . .	1½-inch.						1¾-inch.						1¾-inch.					
Pressure at Hydrant, lbs. . . .	42	56	70	84	98	112	49	65	81	97	113	129	58	77	96	116	135	154
Pressure at Nozzle, lbs. . . .	30	40	50	60	70	80	30	40	50	60	70	80	30	40	50	60	70	80
Pressure lost in 100 ft., 2½-in. hose, lbs. . . . .	12	16	20	24	28	32	9	25	31	37	43	49	28	37	46	56	65	74
Vertical Height of Stream, ft. .	52	65	75	83	88	92	53	67	77	85	91	95	55	69	79	87	92	97
Horizontal Dis. of Stream, ft. .	50	59	66	72	77	81	54	63	70	76	81	85	56	66	73	79	84	88
Gals. Discharged per minute .	206	238	266	291	314	336	256	296	331	363	392	419	315	363	406	445	480	514

The table above and these notes have been condensed from a paper by John R. Freeman, read before the New England Water Works Association, December, 1889, entitled "Some Experiments and Practical Tables Relating to Fire Streams." For further information, see the Journal of that Association for March, 1890.

# GOULDS VERTICAL SUBMERGED CENTRIFUGAL PUMP.

CENTRIFUGAL PUMPS HAVE A GENERAL APPLICATION FOR IRRIGATING AND DRAINING SUGAR AND RICE PLANTATIONS, FOR CONTRACTORS' USE, DRAINING SEWERS, COFFER DAMS, WHEEL AND LOCK PITS, EXCAVATIONS, ETC.; FOR SUGAR HOUSES, BLEACHERIES AND DYE WORKS, OIL MILLS, TANNERIES, BREWERIES, DISTILLERIES, STARCH FACTORIES, ETC.

Fig. 694 represents an Improved Vertical or Submerged Centrifugal Pump, adapted for any use where submerged Pumps can be placed. These Pumps are constructed without valves, hence will raise water containing sand, gravel, clay, coal, tan bark or other impurities. They will also pump still slop, brewers' mash, and pulp, as readily as clear water, and will not clog or become foul.

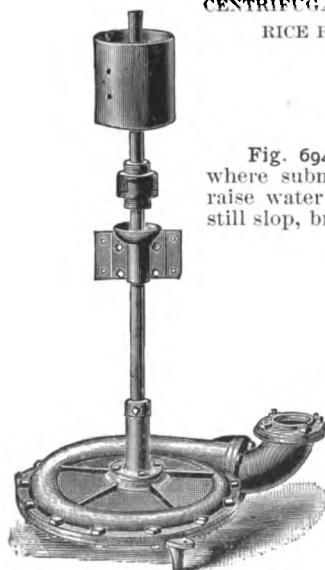


FIG. 694. SIZES AND PRICES.

No. . .	1½	1¾	2	2½	3	3½	4
Iron . .	Zymek \$30.00	Pant \$40.00	Pare \$60.00	Wander \$70.00	Park \$75.00	Wane \$95.00	Part \$110.00
Brass . .	Bill \$55.00	Peak \$90.00	Peal \$110.00	Wang \$135.00	Peat \$150.00	Wangan \$200.00	Peck \$240.00
No. . .	5	6	8	10	12	15	18
Iron . .	Zymel \$140.00	Pass \$170.00	Past \$265.00	Pate \$330.00	Path \$420.00	Pave \$600.00	Pawn \$850.00
Brass . .	Bind \$315.00	Peek \$360.00					

FIG. 694.

TABLE SHOWING NUMBER OF REVOLUTIONS PER MINUTE NECESSARY AND POWER REQUIRED TO RAISE WATER TO DIFFERENT HEIGHTS WITH THE DIFFERENT SIZES OF PUMPS.

No. of Pump.	Maximum Capacity per Minute.	Approximate Power required per Foot Lift.	Discharge Pipe.	Suction Pipe.	Diameter of Pulley.	Face of Pulley.	REVOLUTIONS PER MINUTE.							
							6 ft.	10 ft.	16 ft.	20 ft.	25 ft.	35 ft.	40 ft.	50 ft.
1¼	200 gals.	.085 h. p.	2 in.	2 in.	6 in.	6 in.	425	680	825	900	975	1220	1170	1284
2	300 "	.126 "	2 "	2½ "	7 "	8 "	400	525	650	720	780	908	960	1058
2½	450 "	.190 "	2½ "	3 "	7 "	8 "	375	475	600	675	720	875	940	1010
3	650 "	.270 "	3 "	4 "	7 "	8 "	350	425	500	550	650	850	910	990
3½	1000 "	.425 "	3½ "	5 "	10 "	10 "	325	410	475	525	625	825	900	950
4	1250 "	.504 "	4 "	5 "	10 "	10 "	275	350	450	500	600	800	890	920
5	1850 "	.765 "	5 "	6 "	10 "	10 "	260	330	430	480	560	750	860	900
6	2650 "	1.10 "	6 "	8 "	12 "	12 "	209	240	360	420	490	580	610	650
8	4750 "	1.90 "	8 "	10 "	15 "	12 "	185	225	310	360	390	450	475	500
10	7500 "	3.14 "	10 "	12 "	18 "	14 "	166	220	285	320	360	414	436	470
12	10000 "	4 "	12 "	14 "	20 "	14 "	160	210	246	268	285	320	335	365
15	16000 "	6.75 "	15 "	18 "	30 "	18 "	100	148	208	220	236	264	277	300
18	22000 "	9.65 "	18 "	24 "	40 "	24 "	80	110	148	155	168	204	220	254

# GOULDS HORIZONTAL CENTRIFUGAL PUMPS.

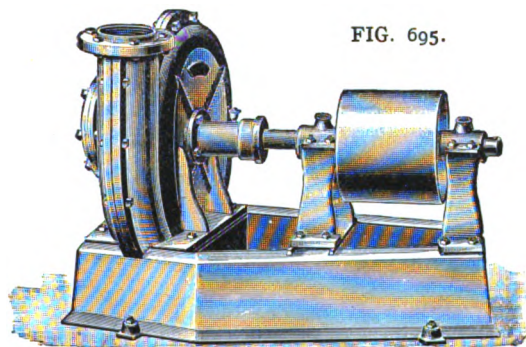


FIG. 695.

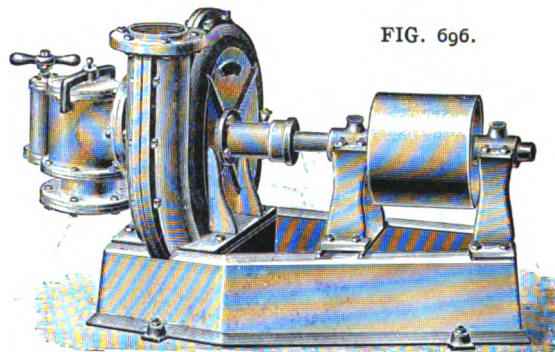


FIG. 696.

**Fig. 695** represents our improved Horizontal Centrifugal Pump, which is the vertical Pump resting on its edge, securely fastened to an iron bed frame by flanges cast on each shell. This Pump must be set so that water will flow into it, unless a foot valve is used in the bottom of induction pipe, in which case it may be set to not exceed twenty-five feet above the water.

This Pump with foot valve at bottom of suction pipe is chiefly used for irrigation and draining.

**Fig. 696** is the same as the **Fig. 695**, with the addition of a Primer for priming by hand. This style is used where Pumps are set above water. Our new Hand Primer is so arranged that there is but one valve; this valve can be reached in a moment by taking out two cap screws and removing plate. We make Power Primers for larger pumps. *Pumps built to run Right or Left handed as desired.* In ordering state whether Pump should run Right or Left handed. Pumps shown in cut run Right-handed.

**FIG. 695. SIZES AND PRICES.**

No.	1½	1¾	2	2½	3	3½	4	5	6	8	10	12	15	18
Iron	Bung 35.00	Mane 50.00	Many 70.00	Wanting 80.00	Mar 95.00	Wanty 110.00	Mare 130.00	Broadcast 165.00	Mark 200.00	Marl 310.00	Mars 395.00	Mart 500.00	Mash 710.00	Mask 1000.00
Brass	Bunged 65.00	Mass 100.00	Mast 125.00	Wanze 150.00	Mat 175.00	Waped 230.00	Mate 275.00	Brushing 350.00	Maul 410.00					

**FIG. 696. SIZES AND PRICES.**

No.	1½	1¾	2	2½	3	3½	4	5	6	8	10	12	15	18
Iron	Cabined 45.00	Oval 60.00	Oven 85.00	Wapiti 95.00	Over 110.00	Wappe 135.00	Oxen 155.00	Bugler 195.00	Oyer 240.00	Pace 375.00	Pack 470.00	Page 600.00	Pail 850.00	Pain 1250.00
Brass	Cabines 80.00	Pair 120.00	Pall 150.00	Wardship 175.00	Palm 210.00	Wardsman 270.00	Pane 330.00	Bunch 420.00	Pang 495.00					

**FLANGED FOOT VALVES FOR FIGS. 694, 695 AND 696.**

No.	1½	1¾	2	2½	3	3½	4	5	6	8	10	12	15	18
Iron	5.00	6.00	7.00	8.00	9.00	11.00	12.00	15.00	20.00	30.00	40.00	50.00	75.00	110.00
Brass	8.00	9.00	12.00	15.00	18.00	21.00	25.00	30.00	40.00					

# GOULDS "ALERT" DOUBLE-ACTING POWER PUMP.

FOR ELEVATIONS TO FIFTY FEET OR EQUIVALENT PRESSURE.

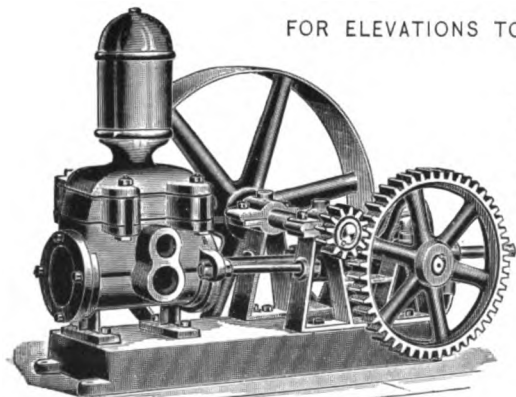


FIG. 785 1/2.

Fig. 785 1/2 is a Light Service Tank Pump. It has a substantial bed plate, machine-cut gear and pinion, pulley to be driven by belt (tight and loose pulleys and out-board bearing at extra price), leather valves, brass-cased piston rod, cup leather packed piston. Brass-lined cylinder at special price. Suction and discharge connections on both sides of cylinder, tapped for standard wrought-iron pipe. Fitted for hose at extra price.

FIG. 785 1/2. SIZES, PRICES, ETC.

PISTON.		Capacity One Rev. of Crank Shaft.	Suction.	Discharge.	Geared.	Pulley.	Cipher.	Price.
Dia.	Stroke.							
3 in.	5 in.	.31 gal.	1 1/4 in. pipe.	1 in. pipe.	4 to 1	20 x 3 in.	Zoon	\$55.00
3 1/2 in.	5 in.	.42 "	1 1/2 "	1 1/4 "	4 to 1	20 x 3 "	Zope	75.00
4 "	5 "	.54 "	1 1/2 "	1 1/4 "	4 to 1	20 x 3 "	Zoril	85.00

## DOUBLE-ACTING POWER PUMP.

FOR ELEVATIONS TO TWENTY-FIVE FEET OR EQUIVALENT PRESSURE.

Fig. 1004, Power Double-Acting Suction and Force Pump, is mounted on bed plate, has machine-cut gears, tight and loose pulleys, brass-lined cylinder, brass valves and valve seats. The discharge valves are accessible through ports or hand holes closed with plugs, or the suction valves below may be reached by removing either cylinder head.

The solid piston is double crimped packed. Piston rod of steel works through brass stuffing box.

Pump is specially designed for pumping oil from tank cars into other receptacle, or where working head is very low.

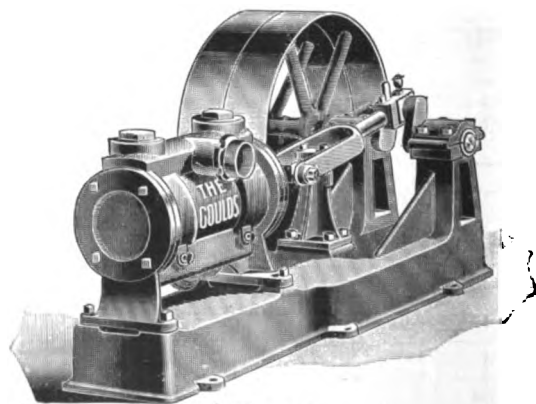


FIG. 1004. SIZE, PRICE, ETC.

FIG. 1004.

PISTON.		Capacity one Rev. of Crank Shaft.	Suction.	Discharge.	Pulleys, Each.	Cipher.	Brass Lined.
Diameter.	Stroke.						
5 in.	5 in.	.86 gal.	2 in. pipe.	2 in. pipe.	20 x 4 in.	Baldrib	\$75.00

# GOULDS "CHALLENGE" DOUBLE-ACTING POWER PUMP.

FOR ELEVATIONS TO 75 FEET OR EQUIVALENT PRESSURE.

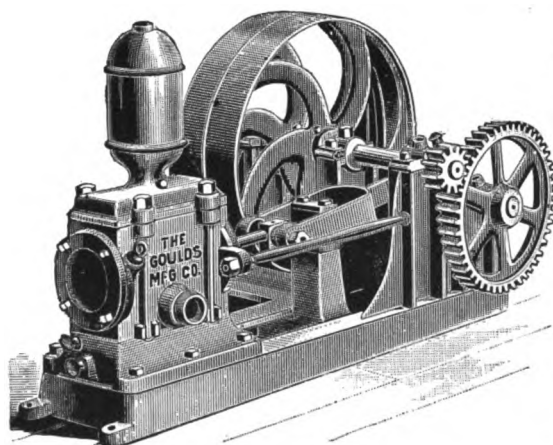


FIG. 824½.

Fig. 824½ is a light service Pump for filling tanks, circulating fluids of any kind, etc. Sometimes used as an Air Pump for condensing engines.

It has a substantial bed plate, machine-cut gear and pinion, tight and loose pulleys, to be driven by belt (the 2½, 3 and 4 inch Pumps have out-board bearing for pulley shaft), bronze valves and valve seats (5 and 6 inch Pumps furnished with rubber-faced valves if desired), brass-lined cylinder, cup leather packed piston (metallic packed piston at extra price) and brass-cased piston rod. The suction and discharge are regularly fitted for wrought-iron pipe; fitted for hose if so ordered.

FIG. 824½. SIZES, CAPACITIES, ETC.

PISTON.		Capacity one Rev. of Crank Shaft.	Suction.	Discharge.	Geared	Pulleys Each.	Cipher.	Brass Lined
Dia.	Stroke.							
2½ in.	4½ in.	.20 gal.	1¼ in. pipe.	1 in. pipe.	4 to 1	20X3 in.	Zoste	\$85.00
3 "	4½ "	.27 "	1¼ "	1 "	4 to 1	20X3 "	Zostera	90.00
4 "	4½ "	.50 "	1½ "	1¼ "	4 to 1	20X3 "	Zouave	95.00
5 "	5 "	.85 "	2 "	1½ "	3 to 1	20X4 "	Zound	125.00
6 "	5 "	1.22 "	2½ "	2 "	3 to 1	20X4 "	Zuche	150.00

## GOULDS DOUBLE-ACTING AIR COMPRESSOR, VACUUM AND WATER PUMP.

Fig. 817 is a Horizontal Piston Pump, to be used as an Air Compressor, as a Vacuum Pump, and also as a Water Pump. It is mounted on a heavy bed plate, which makes it self-contained. The cylinder is iron (brass-lined to order); the piston has metal spring packing; piston rod of steel (brass-cased to order), valves and seats of bronze; suction and discharge connections at both sides of the cylinder and fitted for wrought-iron pipe; gear and pinion machine cut; tight and loose pulleys. Limit pressure for steady work, 30 to 40 pounds. Pump is geared 3 to 1, and has 20 x 4 inch tight and loose pulleys.

FIG. 817. SIZES, PRICE, ETC.

PISTON.		Displ. one Rev. of Crank Shaft.	Speed and Displ. per Min., varying with Kind of Work and Pressure.	Suction.	Dis.	Cipher.	Brass Lined.
Dia.	St'ke.						
6 in.	5 in.	282 cu. in. 1.2 gal.	For Water, { 30 to 40 revs. { 36 to 48 gals. For Air, { 50 to 75 revs. { 60 to 90 gals.	2½ in. pipe.	2 in. pipe.	Eoba	\$150.00

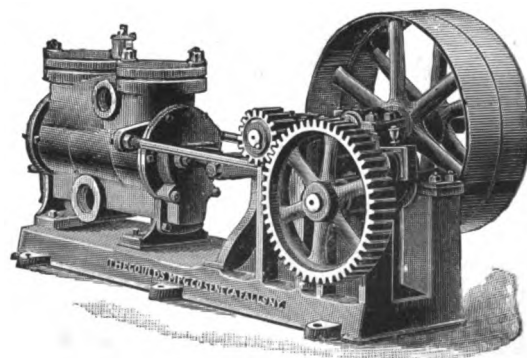
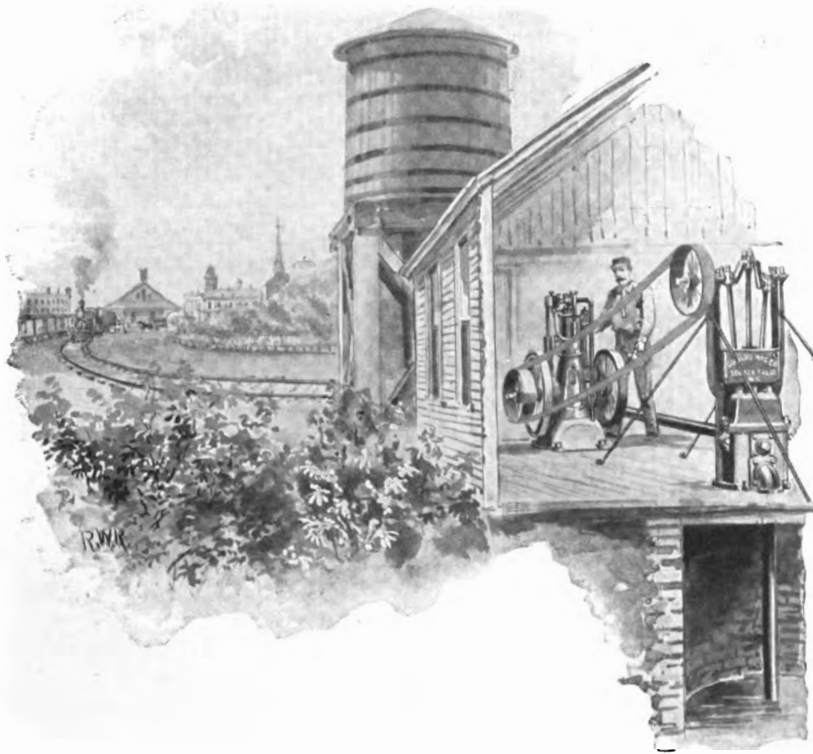


FIG. 817.

## GOULDS TRIPLEX IRRIGATION PUMP.



This picture illustrates an every-day scene where irrigation is practised. Gasoline and petroleum engines are rapidly coming into use for pumping water, not only for irrigation purposes, but also for village and town water supply.

The Pump illustrated and described on opposite page is intended, more particularly, for localities where water is obtainable near the surface. On pages 97 to 102 we illustrate and describe a complete line of Deep Well Pumps and

**Power Working Heads** to elevate water from depths of several hundred feet. Where water is to be elevated only a few feet, we would recommend our Centrifugal Pumps, described on pages 176 and 177.

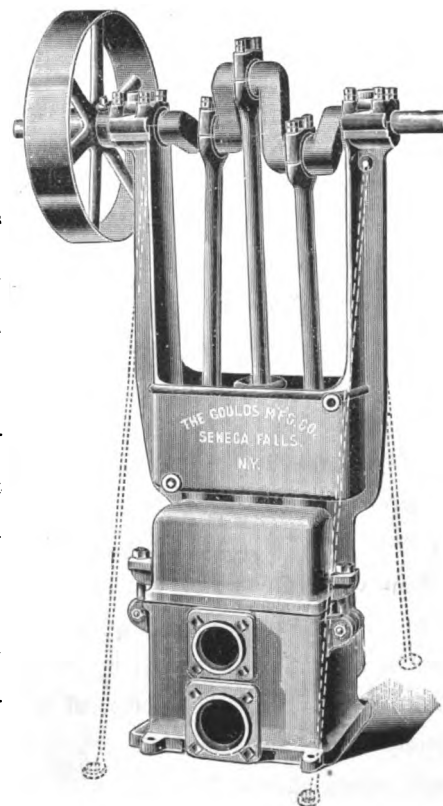
# GOULDS TRIPLEX POWER PUMP.

FOR ELEVATIONS UP TO 50 FEET OR EQUIVALENT PRESSURE.

**Fig. 1010** is a new type of Triplex Power Pump for such light service as required for irrigating land, watering stock, filling tanks, etc. It is fitted with pulley to be driven by belt connection from gas, gasoline, petroleum engine, or other motive power.

The valves are rubber faced with bronze seats, the plungers are inside-packed and have water seals; substantial connecting rods and crank shaft with ample bearings. Crank shaft is extended at both ends so that pulley can be used at either end, or pulleys may be mounted at both ends.

It has but few working parts and they are readily accessible for inspection and care. Altogether it is a most excellent, serviceable Pump and we anticipate a large demand for it from the agricultural districts.



**FIG. 1010.**

**FIG. 1010. SIZES, CAPACITIES, ETC.**

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Min.	Suction.	Discharge.	Pulley.	Cipher.	* Price.
Dia.	Stroke.							
4 in.	8 in.	1.3 gals.	50 to 60 revs.— 65 to 78 gals.	3½ in. pipe.	3 in. pipe.	20 x 4 in.	Riceba	
5 "	10 "	2.5 "	50 to 60 " —125 to 150 "	4 "	4 "	30 x 5 "	Boycott	
6 "	12 "	4.4 "	56 to 60 " —220 to 264 "	5 "	5 "	36 x 6 "	Boydhood	

\* Prices upon application.

## GOULDS TRIPLEX POWER PUMP.

**G**OULD'S TRIPLEX POWER PUMP is an interesting machine; it is built on the principle that a continuous action of parts produces a constant flow of fluids and resultant high efficiency. Efficiency is the ratio between the effective, or useful, work and the total work put into a machine. The effective, or theoretical, work of a Pump lifting water is the quantity of water lifted to a certain height. When the rate of doing this work of pumping is considered it is measured in horse power. The actual horse power consumed in pumping water includes, not only the delivery of a certain quantity to a given height, but also the power required to overcome its inertia, viz.: to start it from a state of rest and to stop it; its friction in passing through the pipes and the Pump; and the inertia and friction of the working parts of the Pump.

Undoubtedly, the cheapest form of Pump to build, to deliver a given quantity of water, is the Pump with one cylinder containing one double-acting piston. Its working parts are few and their friction area is small in proportion to displacement, or capacity; but the intermittent action of such a Pump upon the water causes waste of power, which is manifested by the noise or water hammer at the completion of each stroke. Small Pumps of this kind are used to some extent, and their defective action is partially remedied by large air chambers and excessively heavy driving gearing. Large Pumps of this kind are not in successful use because it is impossible to thus cover up their defects. The duplex Pump is better; yet it is found in service with large air chambers, excessively heavy mortise gearing, and, when driven by belt, with a heavy fly-wheel pulley—significant indications of its imperfections.

The Triplex Pump is one of continuous action and high efficiency. While it is impracticable to build a Pump that will produce perfectly uniform action upon the water, the work wasted in this particular by the Triplex is only about one-third of that wasted in the best designed duplex or four plunger Pumps; and in this respect the single Pumps are unworthy of comparison. The diagrams on the following page fully illustrate this statement of facts.



# RATE OF SUCTION AND DISCHARGE IN PUMPS

OPERATED BY CRANK SHAFT, WITHOUT AIR CHAMBER.

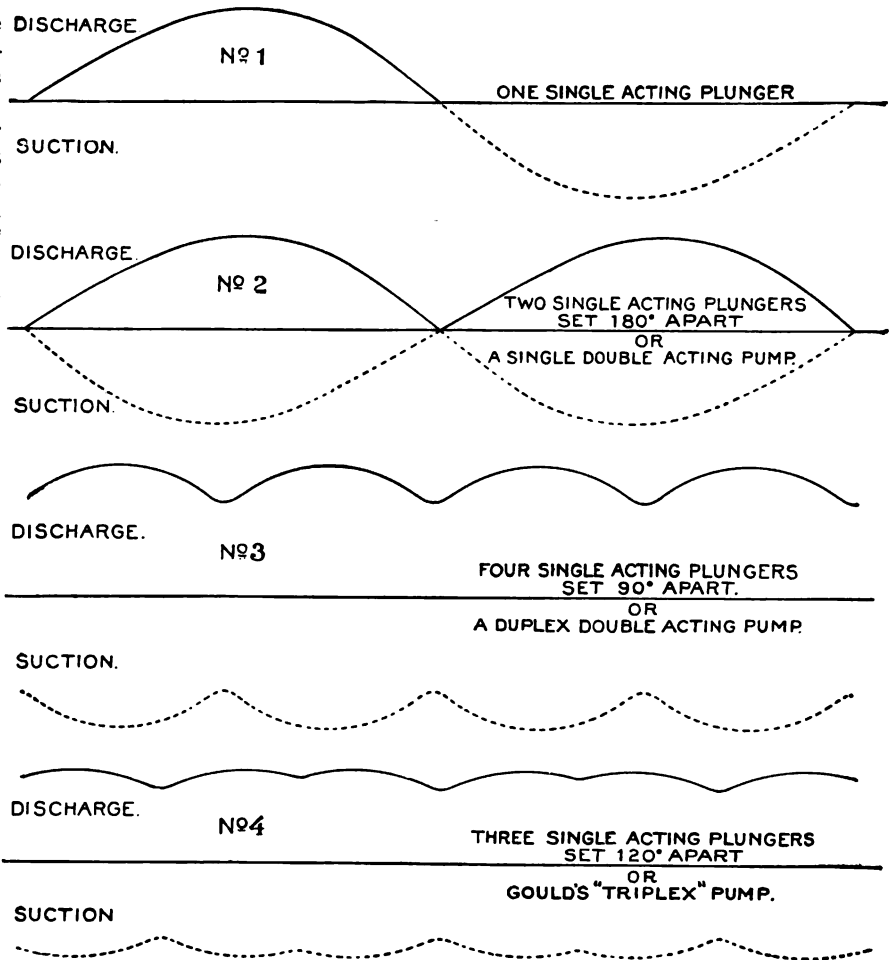
The dotted lines indicate the rate of suction; the full lines, the discharge. The velocity (which is identical with the rate of suction and discharge) of the plunger, or piston, increases from nothing, at the beginning of the stroke, to maximum at about half-stroke; and decreases to nothing at the end of the stroke.

**No. 1** shows the rate of suction and discharge during one revolution of a crank shaft, operating one single-acting plunger or piston.

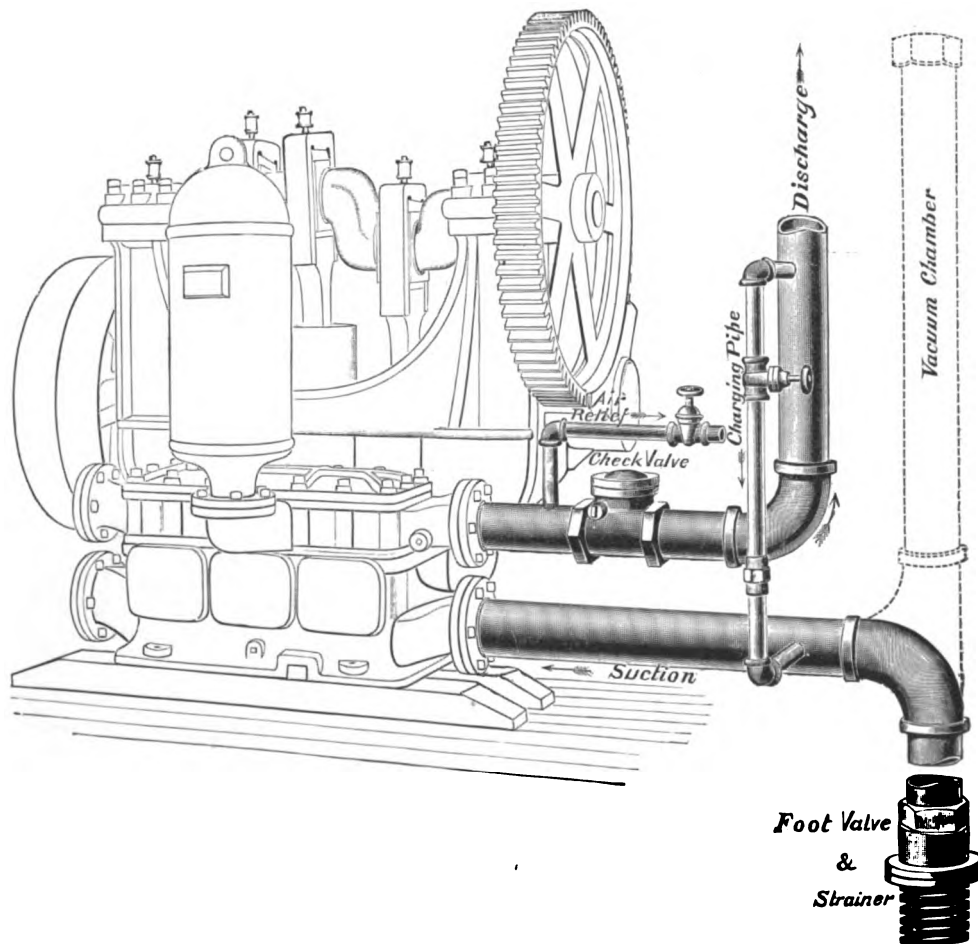
**No. 2** shows the rate of suction and discharge during one revolution of a crank shaft, operating two single-acting plungers, with cranks 180 degrees apart; or one double-acting piston.

**No. 3** shows the rate of suction and discharge which results from plungers, or pistons, working together, during one revolution of a crank shaft, operating four single-acting plungers with cranks 90 degrees apart, or two double-acting pistons with cranks at right angles.

**No. 4** shows the rate of suction and discharge which results from plungers, or pistons, working together during one revolution of a crank shaft, operating three single-acting plungers, or three double-acting pistons, with cranks 120 degrees apart.



## PLAN OF PIPING GOULDS TRIPLEX POWER PUMPS.



See opposite page for explanation.

# GENERAL DIRECTIONS FOR PLACING AND OPERATING GOULDS TRIPLEX POWER PUMPS.

Foundations for many of our Pumps need not be other than a good plank floor such as is found in any well built mill or factory. The heavier Pumps should have substantial foundations of brick or stone with anchor bolts. (Drawings embodying principal dimensions of Pumps will be sent upon application so that the foundations may be completed before the arrival of the Pump.) Our Triplex Power Pumps are self-contained and not dependent upon foundations to maintain alignment of working parts, but a good foundation is essential to preserve correct position of the Pump relative to driving mechanism and also to avoid undue strain upon pipe connections.

**SUCTION PIPE.** — The suction pipe should be as short and direct as possible and never of smaller size than the Pump provides for, increasing the size when several elbows or long lengths of pipe are necessary. Use a foot-valve with strainer attached. It is sometimes desirable to use a vacuum chamber. For connecting this, place a tee in the suction pipe near the Pump. A good vacuum chamber can be made of pipe, same size as suction pipe, six to ten diameters in length.

**DISCHARGE PIPE.** — The discharge pipe should be provided with a check valve placed near the Pump. Upon starting up, to insure immediate action of the Pump, where it takes suction under difficult conditions and there is air in the suction pipe and Pump, connect a charging pipe with a gate valve from a point in the discharge pipe beyond the check valve to the suction pipe.

Also connect a relief pipe with a gate valve into the discharge pipe between the Pump and check valve. Opening the valve in the changing pipe allows water to flow from reservoir or tank back through the discharge pipe into the suction pipe and Pump, discharging the air through the relief pipe.

The recess around plungers and glands collects the slight leakage and this should be piped away to drain.

To guard against overloading (abnormally high pressure) and consequent injury, **EVERY POWER PUMP** should have an automatic water relief valve connected to the discharge pipe close to the Pump. Adjust this valve to relieve at a pressure within the limits of strength of the Pump. Do NOT confuse this automatic water relief with the “relief-pipe” and “valve” shown in the illustration on the opposite page. The automatic valve and a good method of piping it, are shown on page 195, under the subject of Boiler Feed Pumps.



## GOULDS TRIPLEX TANK PUMPS FOR GENERAL SERVICE.

Pumps of this class are naturally divided into three or more groups according to elevation or pressure pumped against. For elevations up to 20 or 25 feet, the Centrifugal Pumps are largely employed (see pages 176 and 177). For elevations from 25 to 100 feet, our **Fig. 957** is specially adapted. It is illustrated on this page in operation, and described in detail on opposite page. We have other types for light service pumping: **Fig. 1010** (page 181) and **Fig. 824½** (page 179). For elevations of 100 feet and over, we recommend **Fig. 924** (page 189), or **Fig. 1009** (page 191), and for water supply on a larger scale, **Fig. 920** (pages 230 and 231).

This subject of pumping is of interest not only to cities and towns, but also to manufacturers and mill owners generally. Few concerns can afford to buy water because it can be pumped on the premises at much less cost. We solicit correspondence.

# GOULDS TRIPLEX POWER WATER SUPPLY PUMP.

FOR ELEVATIONS TO 100 FEET OR EQUIVALENT PRESSURE.

**Fig. 957, Light Service Triplex Power Pump,** is designed and built expressly for pumping water to tanks or reservoirs; directly into pipe systems; and for circulating fluids of any kind.

It is a special type of our standard Triplex construction, having large valve area, outside packed plungers with water seal, strap head crank bearings with phosphor-bronze boxes, machine-cut gear and pinion. It has tight and loose pulleys for belt drive from line shaft, or from gas, gasoline, petroleum or steam engine, or by electric motor. Our regular construction is: iron plungers, cylinders and glands, with bronze valves, rubber face disks for cold water. Can be changed to meet special requirements.

FIG. 957.

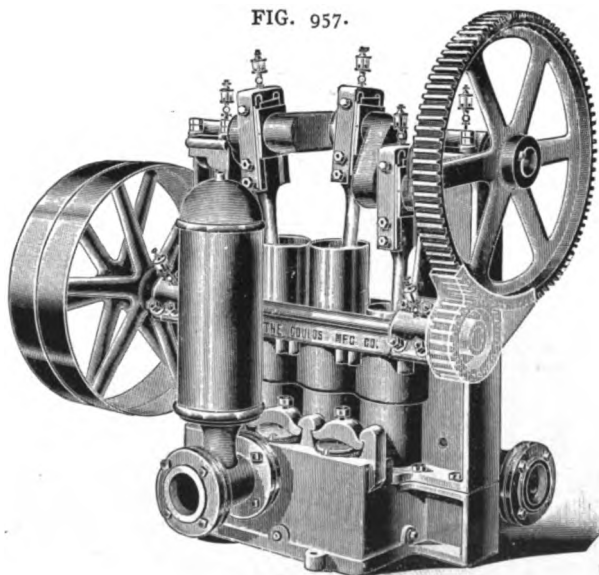


FIG. 957. SIZES, CAPACITIES, ETC.

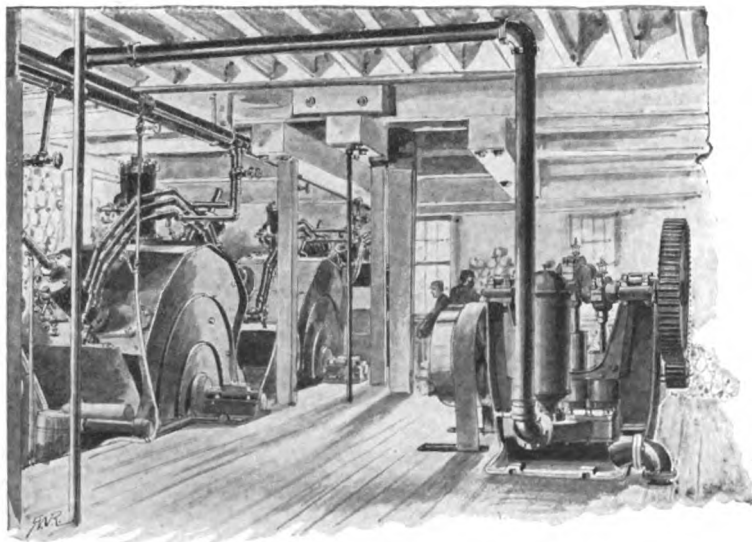
PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Minute, varying with Kind of Work and Pressure.	Suction.	Discharge.	Geared.	Pulleys, Each.	Cipher.	* Price.
Dia.	Stroke.								
7 in.	8 in.	4 gals.	20 to 45 revs.— 80 to 180 gals.	4 in. pipe.	4 in. pipe.	4 to 1	30 x 6 in.	Writhes	
8 "	10 "	6.5 "	20 to 40 " —130 to 260 "	6 "	5 "	5 to 1	36 x 6 "	Writin	
8 "	12 "	7.8 "	20 to 40 " —156 to 312 "	6 "	5 "	5 to 1	36 x 6 "	Wroken	

\* Prices upon application.

## GOULDS TRIPLEX POWER PUMP WITH GRINDER.

Grinding Wood has become an art. Pulp makers have gathered into their mills the finest of machinery. The modern Hydraulic Grinder, the best of water wheels, power transmitting and conveying machinery lend their aid to expert labor. Amidst this equipment, the Hydraulic Pump bears a most important part.

The hydraulic pressure influences the rate of grinding and the quality of the fibre. With grit, dress and speed of stone just right to grind for wood-board, manilas, news or book, there must be a certain amount of pressure to produce the desired quality of fibre.



In the early days of the hydraulic grinder, we anticipated the demand for a grinder pump and gave the subject study. We designed, built and were the first to apply the Triplex Power Pump to hydraulic grinders. Our Pump designated **Fig. 924** (page 189) has been a success from the first, as is well attested by the fact that they are in daily use in the majority of the ground wood mills of this country.

**Fig. 1009** (page 191) is also well adapted to pressure pumping. When ordering Pumps to be used with Hydraulic Grinders, correspondents will please state: the number of grinders; the diameter and number of hydraulic cylinders on each; length of wood to be ground; horse power per grinder; working pressure proposed; whether one Pump will furnish pressure for forcing down and backing off, or will two Pumps and independent pressures be used.

# GOULDS TRIPLEX POWER PUMP.

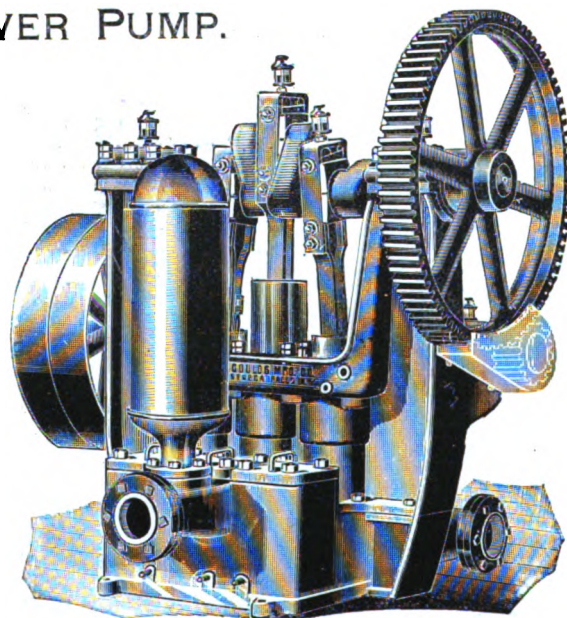
FOR ELEVATIONS TO 300 FEET OR EQUIVALENT PRESSURE.

**Fig. 924** is our Standard Triplex Power Pump for general service, such as boiler feeding, water supply, hydraulic pressure, etc. It is compact, self-contained, and requires no special foundation.

The valves are rubber disks with bronze trimmings and seats (metal valves are used for hot water), all readily accessible. The plungers are outside packed and have water seal. In Pumps 4 by 4 inches and larger, each connecting rod has bronze bushed bearing in plunger, strap-head bearing at crank, and phosphor-bronze box with adjustment. The crank shaft is in one piece and runs in large Babbitted bearings. The gear and pinion are machine cut. Tight and loose pulleys. Sight-feed oil cups.

Our regular construction is: iron cylinders, glands and plungers. These parts are made of bronze, or other material, to order, and the Pump furnished with special valves, adapting it to almost any kind of service.

For pumping hot water, bronze plungers, bronze-lined cylinders and glands are recommended, because more durable than iron. Pumps fitted in this manner, extra, to order. State whether hot or cold water is to be pumped.



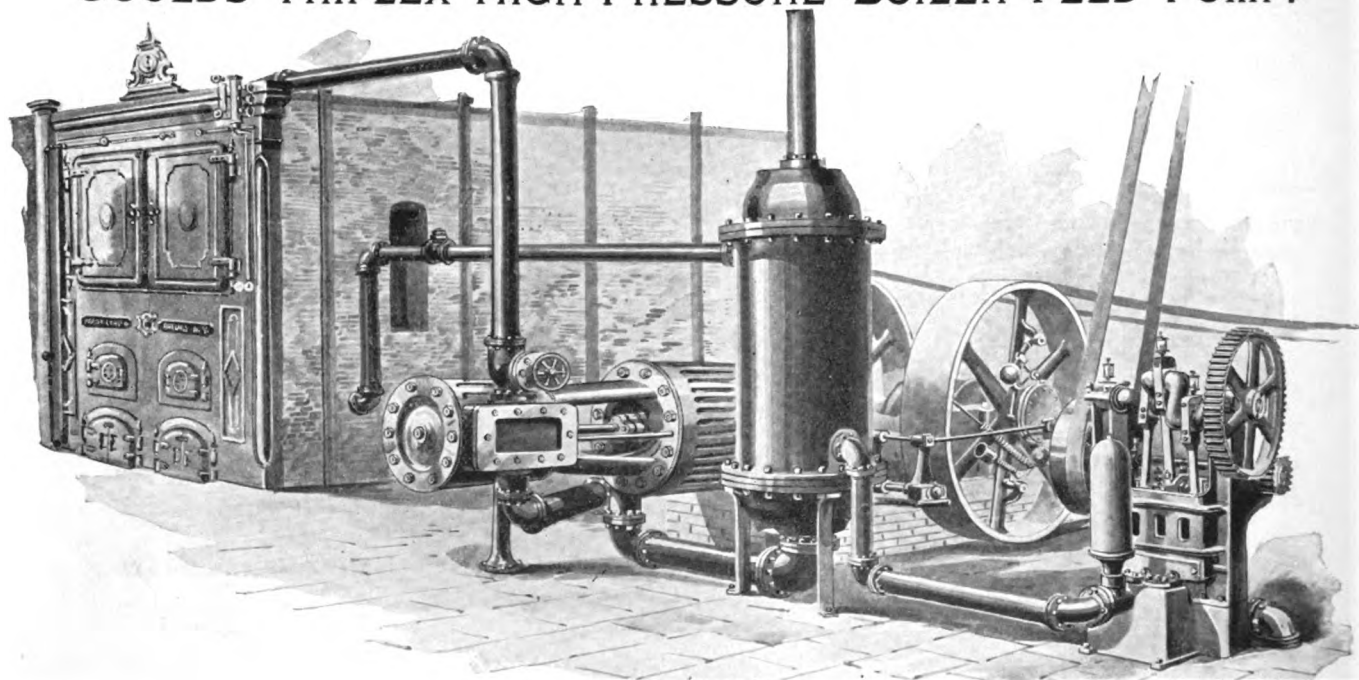
**FIG. 924.**

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Minute, varying with Kind of Work and Pressure.		Suction.	Discharge.	Geared.	Pulleys, Each.	Clpher.	* Price.
Dia.	Stroke.									
1 1/4 in.	2 in.	.03 gal.	40 to 60 revs. —	1.2 to 1.8 gals.	1 1/4 in. pipe.	1 1/4 in. pipe.	5 to 1	12 X 1 1/2 in.	Wheat	
1 3/4 in.	2 1/4 in.	.07 "	40 to 60 " —	2.8 to 4.2 "	1 1/2 "	1 1/2 "	5 to 1	12 X 2 1/2 "	Whew	
2 "	3 "	.12 "	30 to 50 " —	3.5 to 6 "	1 3/4 "	1 3/4 "	5 to 1	12 X 2 3/4 "	Whewer	
2 1/2 in.	4 "	.25 "	30 to 50 " —	7.5 to 12 "	1 1/2 "	1 1/2 "	5 to 1	15 X 3 "	Wench	
3 "	4 "	.36 "	30 to 50 " —	10.5 to 18 "	1 1/2 "	1 1/2 "	5 to 1	15 X 3 "	Wend	
4 "	4 "	.65 "	25 to 45 " —	16 to 29 "	2 "	2 "	5 to 1	20 X 3 "	Wenel	
4 "	6 "	1 "	25 to 45 " —	24 to 44 "	2 "	2 "	5 to 1	20 X 3 "	Wenta	
5 "	6 "	1.5 "	25 to 45 " —	37 to 67 "	3 "	3 "	5 to 1	26 X 4 "	Wereba	
5 "	8 "	2 "	20 to 40 " —	40 to 80 "	3 "	3 "	5 to 1	30 X 5 "	Werste	
6 1/2 in.	8 "	3.4 "	20 to 40 " —	68 to 136 "	4 "	4 "	5 to 1	30 X 6 "	Wooring	
8 "	8 "	5.2 "	20 to 40 " —	104 to 208 "	5 "	4 "	5 to 1	36 X 6 "	Werte	
8 "	10 "	6.5 "	20 to 40 " —	130 to 260 "	5 "	4 "	5 to 1	42 X 6 "	Zylode	
9 "	10 "	8.2 "	20 to 40 " —	164 to 328 "	6 "	5 "	6 to 1	42 X 8 "	Zylom	

\* Prices upon application.

Feed-water for boilers, see page 196.

## GOULDS TRIPLEX HIGH-PRESSURE BOILER FEED PUMP.



The illustration represents a frequent application of our Special Feed Pump in steam plants where compound engines are used with boilers carrying steam at 150 to 200 pounds pressure. Intelligent engineers recognize the economy of a Geared Power Pump for a boiler feeder, as compared with the direct-acting steam Pump, but it has been difficult to find a Power Pump capable of doing this important work in a satisfactory manner. We offer a line of Pumps suitable for high pressure boiler feeding, Figs. 1009 and 1058 (pages 191 and 192) and are prepared to estimate and guarantee their operation and economy.



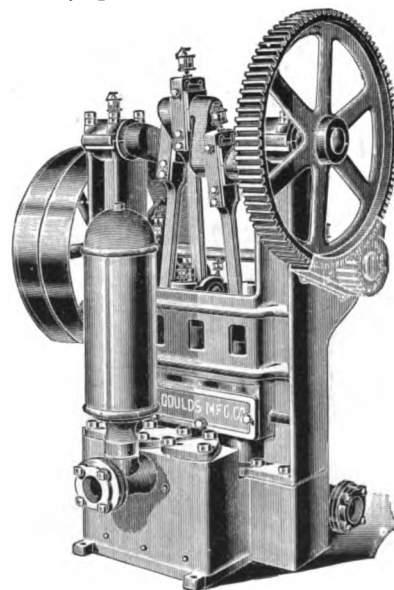
# GOULDS TRIPLEX POWER PUMP.

FOR ELEVATIONS TO 350 FEET OR EQUIVALENT PRESSURE.

**Fig. 1009**, Triplex Power Pump, differs in some points of design and construction from **Fig. 924**, our Standard Pump. It is for general use, such as boiler feeding, water supply, hydraulic pressure, etc., but it is intended for situations where the service is particularly severe and where the somewhat greater first cost is not an objection in view of greater permanence and less expense for maintenance.

It has three single-acting plungers attached to the connecting rods by means of cross-heads which sustain the side thrust of the connecting rods, permitting the plungers to reciprocate through the packing without lateral pressure. By this means, the wear of the plungers, glands and packing is reduced to a minimum and the cross-heads and pins are accessible for attention. The crank shaft and crank bearings are of our regular standard excellence of design and materials. Machine-cut gear and pinion; tight and loose pulleys; large valve area.

Our regular construction is: iron cylinders, plungers, glands and bronze valves with rubber disks for cold water. These parts are made of bronze or other material, to order, adapting the Pump to almost any kind of service; also fitted for hot water when so specified. Illustration shows construction of Pumps 4" x 4" and larger.



**FIG. 1009. SIZES, CAPACITIES, ETC.**

**FIG. 1009.**

PLUNGERS.		Capacity, One Rev. of Crank Shaft.	Speed and Capacity per Minute, varying with Kind of Work and Pressure.	Suction.	Discharge.	Geared.	Pulleys, Each.	Cipher.	*Price.
Diameter.	Stroke.								
1 1/4 in.	2 in.	.03 gal.	40 to 60 revs. — 1.2 to 1.8 gals.	3/4 in. pipe.	3/4 in. pipe.	5 to 1	12 x 1 1/2 in.	Crag	
1 3/4 "	2 1/2 "	.07 "	40 to 60 " — 2.8 to 4.2 "	1 " "	1 " "	5 to 1	12 x 2 1/2 "	Craggy	
2 "	3 "	.12 "	30 to 50 " — 3.5 to 6 "	1 1/4 " "	1 1/4 " "	5 to 1	12 x 2 3/4 "	Crachom	
2 1/2 "	4 "	.25 "	30 to 50 " — 7.5 to 12 "	1 1/2 " "	1 1/2 " "	5 to 1	15 x 3 "	Cragify	
3 "	4 "	.36 "	30 to 50 " — 10.5 to 18 "	1 3/4 " "	1 3/4 " "	5 to 1	15 x 3 "	Crahad	
4 "	4 "	.65 "	25 to 45 " — 16 to 29 "	2 " "	2 " "	5 to 1	20 x 3 "	Craily	
4 "	6 "	1 "	25 to 45 " — 24 to 44 "	2 " "	2 " "	5 to 1	20 x 3 "	Crajum	
5 "	6 "	1.5 "	25 to 45 " — 37 to 67 "	3 " "	3 " "	5 to 1	26 x 4 "	Craiyx	
5 "	8 "	2 "	25 to 45 " — 50 to 90 "	3 " "	3 " "	5 to 1	30 x 5 "	Crakal	

\* Prices upon application.

" Feed-water for boilers," see page 196.

# GOULDS TRIPLEX HIGH-PRESSURE BOILER FEED PUMP.

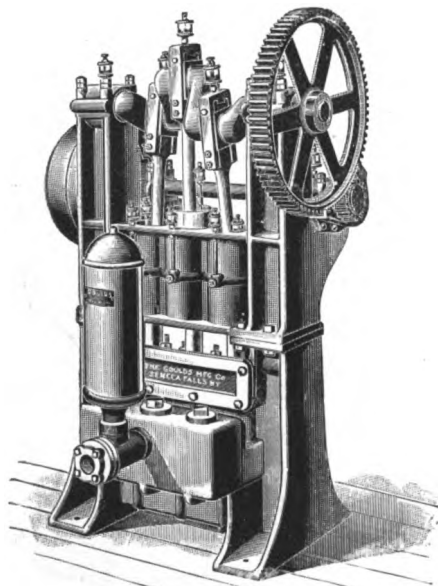


FIG. 1058.

Compound engines and high pressure boilers are rapidly coming into use. We have supplied Power Boiler Feed Pumps for pressures up to and exceeding 200 pounds per square inch.

Fig. 1058 has distinctive features specially adapting it to this service: outside connected plungers with cross-heads and guides; connecting rods have strap ends and phosphor-bronze boxes; heavy bearings; extra weight and stiffness throughout. Our regular construction provides cylinders, plungers and glands of iron, and metallic valves for hot water. We can furnish all working parts of phosphor-bronze when so ordered, at extra price. Correspondents should state the number and horse power of boilers; steam pressure; whether the Pump will handle hot or cold water; general conditions, etc.

For "Quantity of Feed Water," see page 196.

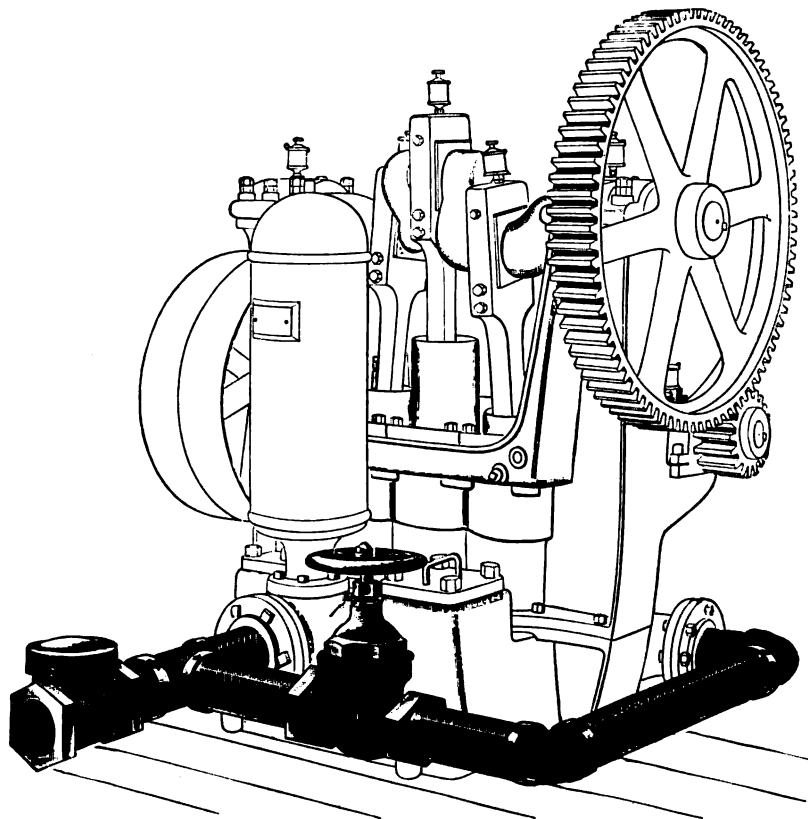
For general directions for placing and operating, see following pages.

FIG. 1058. SIZES, CAPACITIES, ETC.

Plungers.	Capacity, One Rev. of Crank Shaft.	Speed and Capacity per Min., varying with Kind of Work and Pressure.	Limit Pressure per Square Inch.	Suction.	Discharge.	Geared.	Pulleys, Each.	Clipher.	* Price.
2 x 6 in.	.24 gals.	25 to 40 revs. — 6 to 9.6 gals.	225 lbs.	1½ in. pipe.	1 in. pipe.	5 to 1	20 x 3 in.	Dracab	
2½ x 6 "	.38 "	25 to 40 " — 9.5 to 15 "	225 "	1½ "	1½ "	5 to 1	24 x 3 "	Dracic	
3½ x 8 "	1 "	20 to 40 " — 20 to 40 "	225 "	2 "	2 "	5 to 1	30 x 4 "	Dracj	
4 x 8 "	1.3 "	20 to 40 " — 26 to 52 "	200 "	2 "	2 "	5 to 1	30 x 4 "	Dracjum	
4½ x 8 "	1.65 "	20 to 40 " — 33 to 66 "	200 "	3 "	3 "	5 to 1	36 x 6½ "	Dracka	
6½ x 8 "	3.4 "	15 to 35 " — 51 to 119 "	200 "	4 "	4 "	5 to 1	36 x 6½ "	Dracken	

\* Prices upon application.

## GENERAL DIRECTIONS FOR PLACING AND OPERATING GOULDS TRIPLEX POWER BOILER FEED PUMP.



For pumping hot water, always place the Pump below supply; a head of two or three feet on the suction valves of the Pump is desirable.

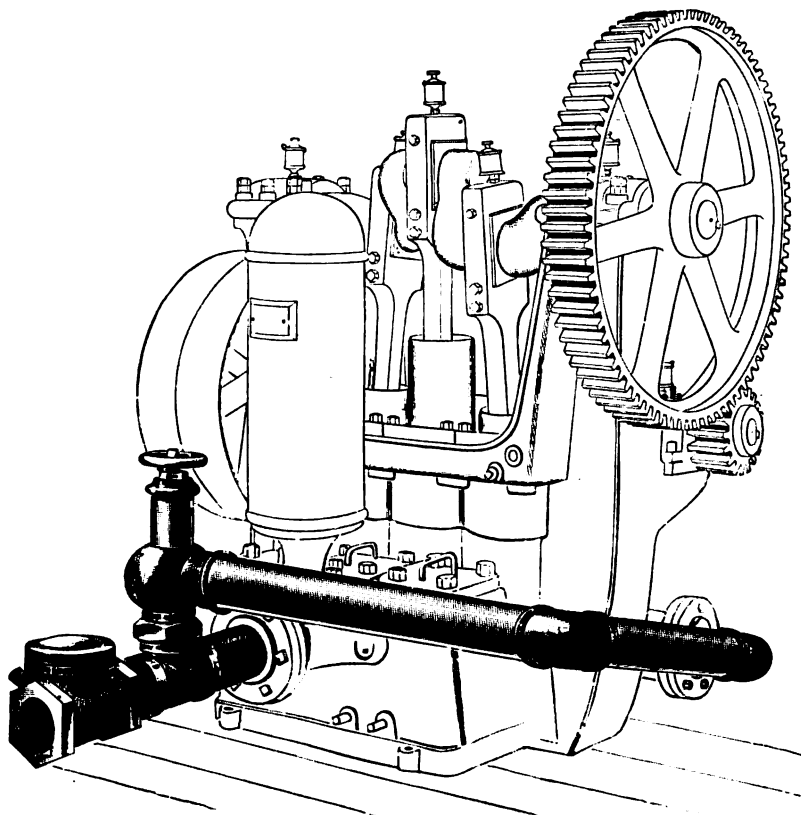
Place a check valve in the discharge pipe near the Pump.

The Power Feed Pump is generally run continuously at a fixed speed, delivering enough feed-water to supply the maximum demands of the boilers while the quantity actually required may vary. To allow for this variation, provide a "by-pass" between the discharge pipe and the inlet side of the Pump. (See illustrations.) When the Pump supplies only one boiler, a common stop valve may be used in this by-pass (see illustration on page 193), leaving the stop valve at the boiler front wide open all the time and regulating the feed by partially opening or closing the stop valve in the by-pass. When more than one boiler is supplied, an automatic relief valve must be used in the by-pass (see illustration, page 195). Adjust this to relieve at a pressure a few pounds above the pressure carried on the boilers. The surplus feed-water runs around through this valve into the Pump again and the supply to each boiler is regulated by its stop valve. It is a good plan to always have a relief valve in connection with a Power Pump when there are stop valves of any kind in the discharge. If the discharge of a Power Pump is shut off when the Pump is running, a dangerously high pressure will be instantly created and the Pump injured. Put the relief valve close to the pump outlet.

Maintain the proper water level in the boilers by continuous feeding; intermittent feeding involves loss of heat in the feed-water and destructive effect on the Boiler.

Packing for Pumps feeding hot water to boilers at high pressure is sometimes difficult to keep tight because improperly adjusted. The essentials of good packing are a strong fibre, well lubricated, and so built up that a moderate pressure of the gland will cause it to hug the plunger. Packing should not be jammed down into the packing space, but pressed down firmly, screwing down the nuts on the gland studs with the fingers. The hot water will swell the packing to sufficient tightness. Occasional slight adjusting is all that should be required.

In repacking a pump it is not always necessary to remove the old packing as a few new layers may suffice, but do not keep packing in after it becomes hard and rough with gritty matter because it will quickly cut the plunger.



## QUANTITY OF FEED WATER FOR BOILERS.

Temperature Feed Water.	Steam Pressure.	Feed Water per H. P. per Hour.	Gals. per Min. per 100 H. P.
100 Fahr.	70 lbs.	* 30.00 lbs.	6.02 and 10 per cent. = 6.62
70 "	100 "	29.04 "	5.79 " 10 " " = 6.36
100 "	100 "	29.82 "	5.98 " 10 " " = 6.57
150 "	100 "	31.22 "	6.34 " 10 " " = 6.97
180 "	100 "	32.14 "	6.61 " 10 " " = 7.27
200 "	100 "	32.77 "	6.65 " 10 " " = 7.31
212 "	100 "	33.17 "	6.94 " 10 " " = 7.63

\*This is the standard adopted by the American Society of Mechanical Engineers, and is the generally accepted commercial standard by boiler makers and users.

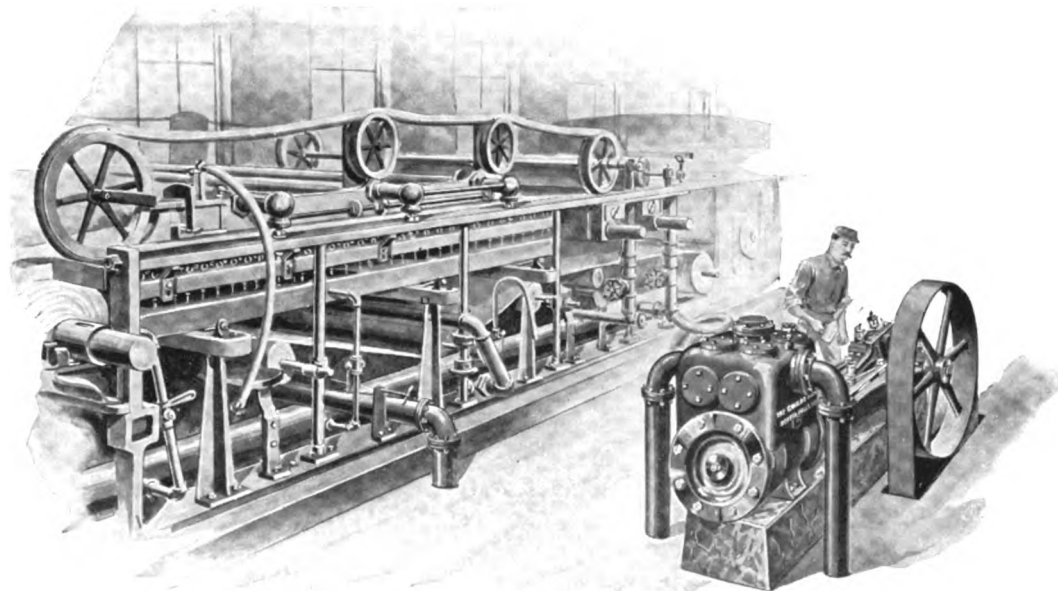
The capacity of a boiler to evaporate water depends, among other things, upon the steam pressure and temperature of the feed water. The pressure makes so little difference that it has been estimated for 100 lbs., as practically correct for all pressures. The difference between making steam at atmospheric and 100 lbs. pressure is only  $3\frac{1}{2}$  per cent. Temperature of the feed water from 100° to 212° will vary the evaporative power of a boiler over 11 per cent.

## TRIPLEX BOILER FEED PUMPS.—Capacity.

Boiler.	Size Pump.	R. P. M. Pump.	FEED WATER.		Temperature Feed Water.
			Gals. per Min.	Lbs. per Hour.	
100 h. p.	2½ in. x 4 in.	{ 27 31	6.57 7.63	3285 3815	100 Fahr. 212 "
150 "	3 " x 4 "	{ 30 35	9.86 11.44	4930 5720	100 " 212 "
200 "	4 " x 4 "	{ 22 25	13.14 15.26	6590 7630	100 " 212 "
250 "	4 " x 4 "	{ 27 31	16.43 19.07	8215 9535	100 " 212 "
300 "	4 " x 6 "	{ 20 23	19.71 22.89	9855 11445	100 " 212 "
400 "	4 " x 6 "	{ 27 31	26.28 30.52	13140 15260	100 " 212 "
500 "	5 " x 6 "	{ 22 26	32.85 38.15	16425 19075	100 " 212 "
600 "	5 " x 6 "	{ 27 31	39.42 45.78	19710 22890	100 " 212 "
800 "	5 " x 8 "	{ 26 31	52.56 61.04	26280 30520	100 " 212 "
1000 "	6½ " x 8 "	{ 20 23	65.70 76.30	32350 38150	100 " 212 "

# GOULDS POWER SUCTION (OR VACUUM) PUMP.

FOR PAPER MACHINES.



Our illustration is an ordinary application of our newly designed Double-Acting Power Suction Pump for use in connection with the suction boxes of paper machines. The marked characteristics of this Pump are fewness of parts and **great** suction capacity. We now offer a complete line of improved Suction Pumps of this type. (See pages 198 to 201.)

On pages 202 and 203 we illustrate and describe our well-known Triplex Power Suction Pump which has been so long and favorably recognized by paper makers. The Triplex Suction Pump has certain features which render it particularly valuable in the paper mill, and is a highly efficient Pump for all kinds of suction box work. It runs well when geared and drives nicely from high speed shafting. It readily handles large quantities of water, delivering it with ease to any part of the mill.

With manilas and other classes of paper made with "slow" stocks, the strong and constant suction tension maintained by the Triplex Pump produces the best results. Our Triplex Suction Pump is largely used with cylinder machines and in connection with the suction boxes on the wet felt of Fourdrinier machines, and we have enjoyed a remarkably large trade in these Pumps for the suction on wet machines in ground wood and sulphite mills.

# GOULDS DOUBLE-ACTING SUCTION (OR VACUUM) PUMP.

FOR PAPER MACHINE SUCTION BOXES

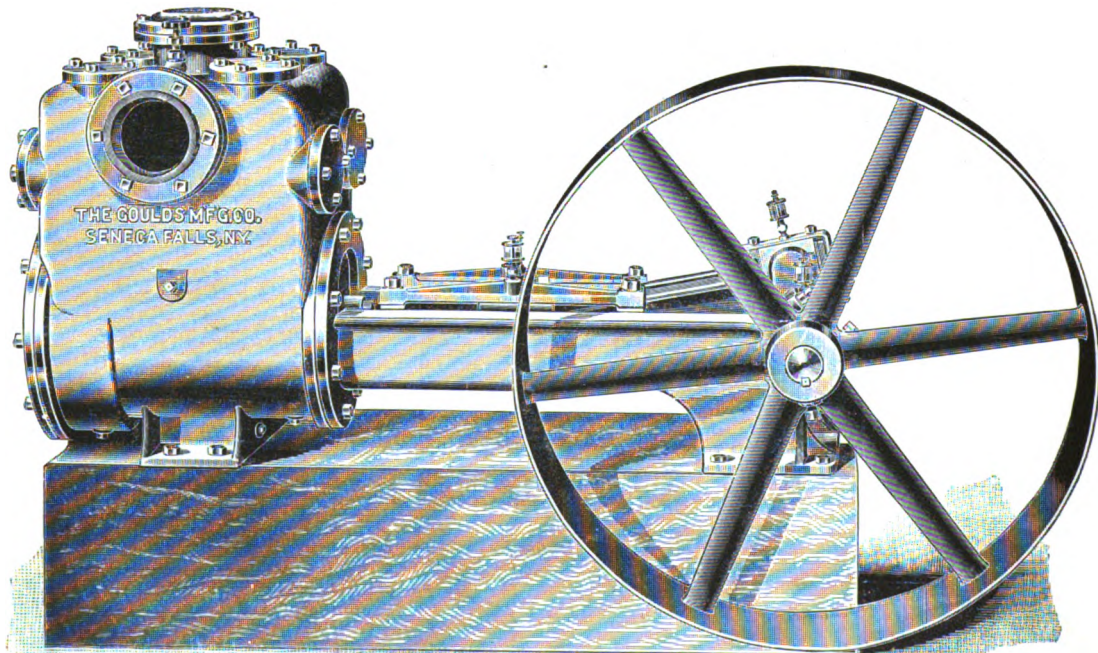


FIG. 1022.

See opposite page for description, etc.



# GOULDS DOUBLE-ACTING SUCTION (OR VACUUM) PUMP.

FOR PAPER MACHINE SUCTION BOXES.

**Fig. 1022**, Horizontal Suction Pump, illustrated on opposite page is the product of mature experience in the manufacture and practical working of Paper Mill Pumps.

The cylinder has a phosphor-bronze lining arranged to equalize the wear and preserve true alignment, and can be speedily removed by any millwright with an ordinary wrench. The piston is of bronze and fitted for square packing. The piston rod is of Tobin bronze and with bronze stuffing box holding sufficient packing to pack the rod without cutting it. Large valve area; the valves quickly accessible. The cross-heads and guides have adjustment for taking up wear. The connecting rod is in one piece with strap ends and phosphor-bronze boxes. Crank shaft of steel. Driving pulley mounted on crank shaft. For Geared Pump see following pages. Discharge connection at side of cylinder; suction at side and top, both. Regulating device to avoid carrying unnecessarily high vacuum. Sight-feed oilers. Pump can be located anywhere relative to the suction boxes.

When inquiring about Suction Pumps please state :

Width of paper machine ; number of suction boxes ;

Range of speeds ;

Kind of stock used ; weights of paper made ;

General Working Conditions.

**FIG. 1022. SIZES, CAPACITIES, ETC.**

PISTON.		Displacement One Revolution of Crank Shaft.	Speed Crank Shaft per Min.	Suction.	Discharge.	Pulley.	Cipher.	* Price.
Dia.	Stroke.							
8 in.	10 in.	4.3 gals.	40 to 50 revs.	3 in. pipe.	3 in. pipe.	48 x 4 in.	Acnodal	
10 "	10 "	6.8 "	40 to 50 "	4 "	4 "	48 x 5 "	Acnode	
12 "	10 "	9.6 "	30 to 40 "	5 "	5 "	48 x 6 1/2 "	Abactor	
14 "	10 "	13.3 "	30 to 40 "	6 "	6 "	48 x 8 1/2 "	Abacus	
14 "	14 "	18.6 "	30 to 40 "	7 "	7 "	48 x 10 1/2 "	Bunol	
16 "	16 "	27.8 "	25 to 30 "	8 "	8 "	60 x 10 1/2 "	Buntel	

\* Prices upon application. Other sizes in preparation.

# GOULDS DOUBLE-ACTING SUCTION (OR VACUUM) PUMP.

FOR PAPER MACHINE SUCTION BOXES

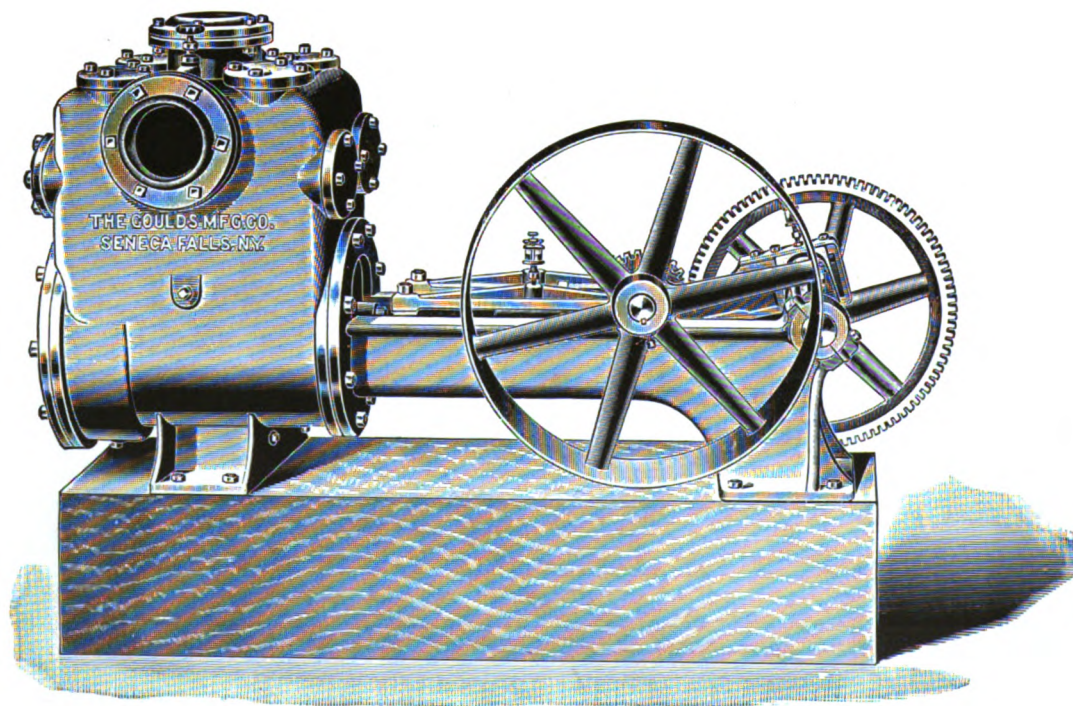


FIG. 1049.

See opposite page for description, etc.

# GOULDS DOUBLE-ACTING SUCTION (OR VACUUM) PUMP.

FOR PAPER MACHINE SUCTION BOXES.

**Fig. 1049**, Geared Horizontal Suction Pump, is illustrated on opposite page. It closely resembles **Fig. 1022**, illustrated and described on the preceding pages. With fast running shafts, driving modern paper machines on news, etc., it is better to reduce to a proper speed by means of a gear and pinion on the Pump than to attempt to drive directly from the line shaft, using a necessarily small driving pulley with a large pulley on the crank shaft of the Pump. Besides allowing the use of pulleys of more nearly the same diameter and a higher belt speed, the gear protects the belt from the direct resistance of the Pump and thus the saving of belts soon pays what the gearing costs. Discharge connection at side of cylinder; suction at side and top both. Regulating device to avoid carrying unnecessarily high vacuum. Sight-feed oilers. Pump can be located anywhere relative to the suction boxes.

When inquiring about Suction Pumps please state:

Width of paper machine; number of suction boxes;

Range of speeds;

Kind of stock used; weights of paper made;

General working conditions.

**FIG. 1049. SIZES, CAPACITIES, ETC.**

PISTON.		Capacity One Rev. of Crank Shaft.	Speed of Crank Shaft per Min.	Suction.	Discharge.	Geared.	Pulley.	Cipher.	* Price.
Dia.	Stroke.								
8 in.	10 in.	4.3 gals.	40 to 50 revs.	3 in. pipe.	3 in. pipe.	4 to 1	30 x 4 in.	Dreba	
10 "	10 "	6.8 "	40 to 50 "	4 "	4 "	4 to 1	30 x 4 "	Drebac	
12 "	10 "	9.6 "	30 to 40 "	5 "	5 "	4 to 1	30 x 5 "	Drebe	
14 "	10 "	13.2 "	30 to 40 "	6 "	6 "	4 to 1	30 x 5 "	Drebe	
14 "	14 "	18.6 "	30 to 40 "	7 "	7 "	4 to 1	36 x 6 "	Drebe	
16 "	16 "	27.8 "	25 to 35 "	8 "	8 "	4 to 1	36 x 6 "	Drebe	

\* Prices upon application.

# GOULDS TRIPLEX POWER SUCTION PUMP.

FOR PAPER MACHINE SUCTION BOXES.

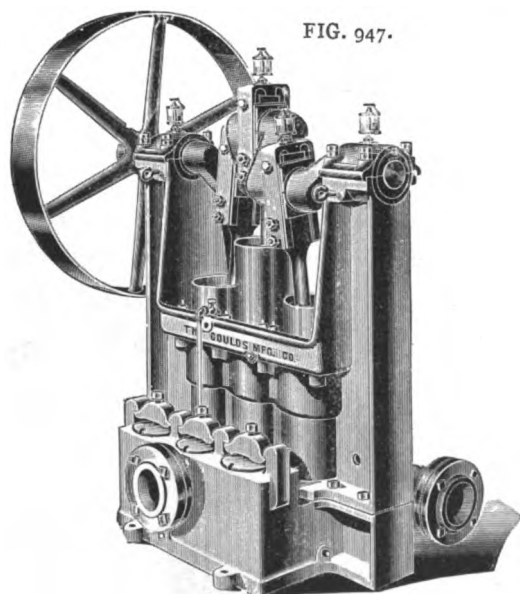


FIG. 947.

**Fig. 947, Triplex Suction Pump,** is of the vertical type and has three single-acting bronze plungers operated by three-throw crank shaft. The cylinders and glands are bronze-lined. Water seal around the plungers, which admits of loosely adjusted packing, and insures great durability and easy running. Large valve area; all valves quickly accessible. Crank shaft complete in one piece and runs in Babbitted bearings. The connecting rods have bronze bushed bearing in plunger and strap head crank bearing with phosphor-bronze box. Sight-feed oilers. Suction connection at either end of the Pump; discharge on the other side. Pump may be placed in any position relative to the paper machine.

FIG. 947. SIZES, CAPACITIES, ETC.

PLUNGERS.		Capacity, One Rev. of Crank Shaft.	Speed of Crank Shaft per Min.	Suction.	Discharge.	Pulley.	Cipher.	* Price.
Dia.	Stroke.							
7 in.	8 in.	4 gals.	40 to 60 revs.	4 in. pipe.	4 in. pipe.	36 x 6 in.	Wraith Repelled Repelling	
8 "	10 "	6.5 "	40 to 60 "	6 "	5 "	48 x 8 "		
8 "	12 "	7.8 "	40 to 60 "		5 "	48 x 8 "		

\* Prices upon application. Please state carefully what the working conditions will be.

# GOULDS TRIPLEX POWER SUCTION PUMP.

FOR PAPER MACHINE SUCTION BOXES.

**Fig. 956**, Triplex Power Suction Pump, is the same as **Fig. 947**, described on opposite page, except it is geared. With fast-running paper machines and high-speed shafting, the Geared Suction Pump drives better than a pump without gears. Pinion and gear are machine cut.

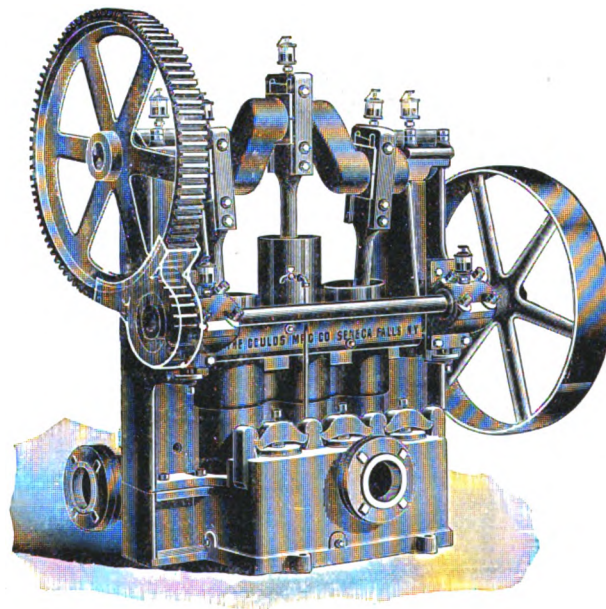
When inquiring about Suction Pumps please state :

Width of paper machine; number of suction boxes ;

Range of speeds;

Kind of stock used; weights of paper made;

General working conditions.



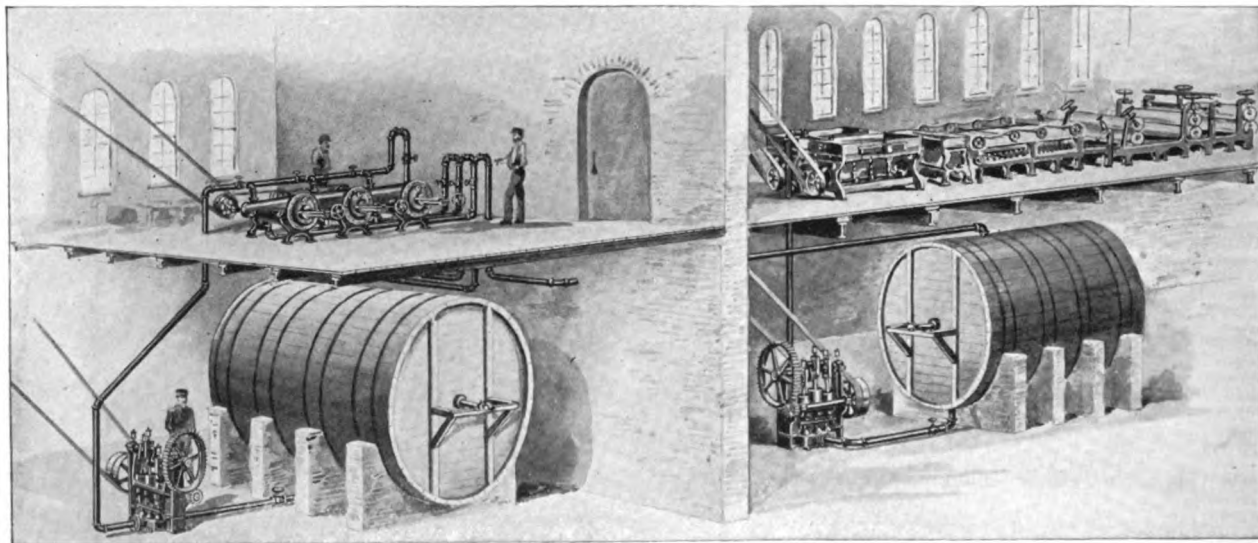
**FIG. 956.**

**FIG. 956. SIZES, CAPACITIES, ETC.**

PLUNGERS.		Capacity, One Rev. of Crank Shaft.	Speed of Crank Shaft per Minute.	Suction.	Discharge.	Geared.	Pulley.	Cipher.	• Price.
Dia.	Stroke.								
7 in.	8 in.	4 gals.	40 to 60 revs.	4 in. pipe.	4 in. pipe.	4 to 1	30 x 6 in.	Wrangle	
8 "	10 "	6.5 "	40 to 60 "	6 "	5 "	5 to 1	36 x 6 "	W rap	
8 "	12 "	7.8 "	40 to 60 "	6 "	5 "	5 to 1	36 x 6 "	Wrapper	

\* Prices upon application.

## GOULDS TRIPLEX STUFF PUMPS AT RUMFORD FALLS.



The picture illustrates the arrangement of our Triplex Stuff Pumps in the mill of the Rumford Falls Paper Co. The stuff is let down from the beating engines from the engine room above into the stuff chest at the left. A Triplex Pump delivers it to a Jorden engine above, thence it gravitates to the machine chest at the right. The second Triplex Pump delivers from this chest to the paper machine above.

Eight of our Triplex Stuff Pumps are now in use. The mill was first started up with fan pumps to supply the refining engines, but were later displaced by the Triplex.

Our Triplex Stuff Pump draughts and delivers stock in an unvarying and continuous flow. When supplying paper machines, this effect contributes largely to uniform weights; when supplying refining engines, it produces uniform fibre—always without pumping a needless surplus. The largest sizes are extensively used in fibre and paper mills for moving pulp in large quantities and are specially valuable where pulp is delivered through long lines of pipe. They run with far less power than Fan, Centrifugal, or Single and Double-Acting Plunger Pumps.

Our standard Triplex Stuff Pump is illustrated and described on the following page.

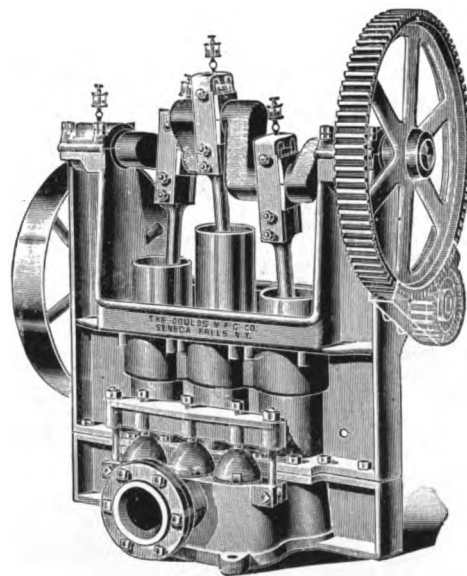
# GOULDS TRIPLEX POWER STUFF PUMP.

FOR PAPER AND PULP MILLS.

**Fig. 969**, Triplex Power Stuff Pump, is self-contained and needs but a firm floor for a foundation. The valves are bronze balls with lift and weight as required, and with bronze seats. All quickly accessible.

The cylinders and glands are of great length and bronze-lined. The plungers are phosphor-bronze and have water seal which aids the packings and insures easy running. All passages are shaped to scour clear, avoiding the formation of "slugs." Each connecting rod has bronze bushed bearing in plunger and strap head crank bearing at crank with phosphor-bronze box. The crank shaft is in one piece and runs in large Babbitt-lined bearings. Sight-feed oilers are provided. The gear and pinion are machine cut.

The pipe flanges are regularly threaded for standard wrought-iron pipe: prepared for copper pipe connections to order. The working strength is ample for all ordinary stuff pumping. Pumps for extra heavy work to order. Pumps without gears can be furnished, but geared pumps drive better and are easier on belts. When inquiring about Stuff Pumps, please state what the service will be.



**FIG. 969.**

**FIG. 969. SIZES, CAPACITIES, ETC.**

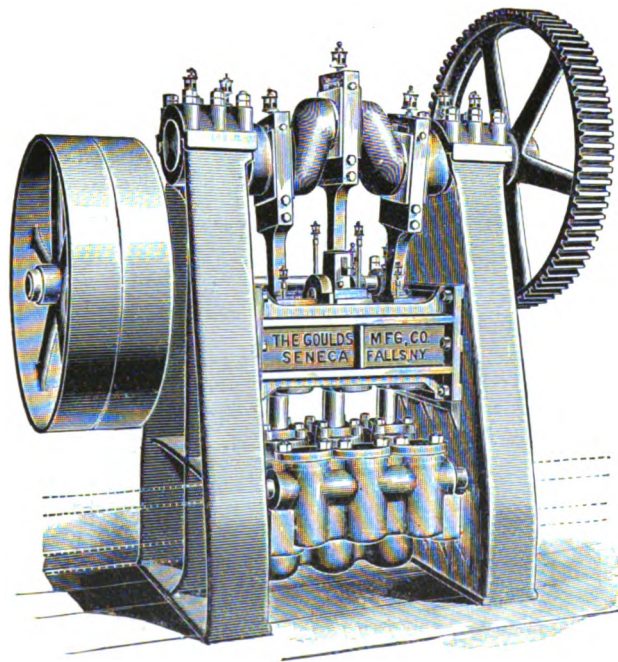
PLUNGERS.		Capacity one Rev. of Crank Shaft.	† Speed per Min. and Capacity in 24 hours, varying with kind of Paper.	Suction.	Discharge.	Geared.	Pulley.	Clpher.	* Price.
Dia.	Stroke.								
4 in.	4 in.	.65 gal.	25 to 40 revs. — 1.7 to 3 tons.	3 in. pipe.	3 in. pipe.	5 to 1	20 X 3 in.	Clubbed	
4 "	6 "	1 "	25 to 40 " — 3 to 5 "	3 "	3 "	5 to 1	20 X 3 "	Wrasse	
5 "	8 "	2 "	20 to 36 " — 5 to 9 "	4 "	4 "	4 to 1	20 X 4 "	Wrathy	
7 "	8 "	4 "	20 to 36 " — 10 to 18 "	5 "	5 "	4 to 1	30 X 5 "	Wraw	
8 "	10 "	6.5 "	20 to 30 " — 16 to 24 "	6 "	6 "	5 to 1	36 X 6 "	Rifely	
8 "	12 "	7.8 "	20 to 30 " — 20 to 30 "	6 "	6 "	5 to 1	36 X 6 "	Rigoris	

† This means the actual finished product of the Paper Machine. At stated speeds the Pump delivers sufficient stuff to make these amounts besides ample return.

\* Prices upon application.



# GOULDS TRIPLEX POWER PRESSURE PUMP.



**Fig. 997, Triplex Power Pressure Pump,** is specially designed for use in connection with Filter Presses, Cotton Presses, Hydraulic Presses and Cranes, Oil Mills, Pipe Works, Deep Mining, etc. It has three single-acting plungers, outside-packed, outside-guided, and outside-connected, operated by a powerfully geared three-throw steel crank shaft. Plungers are regularly made of steel, but can be made of gun metal, phosphor-bronze, or other material, to order, according to intended service. The connecting rods are forged steel with strap heads and phosphor-bronze boxes. The utmost care is exercised in the selection of materials used in these Pumps and every precaution is taken to insure their successful operation under the most exacting conditions. In making inquiries and orders for this class of Pumps, state as fully as possible intended service and requirements.

**FIG. 997. SIZES, CAPACITIES, ETC.**

No.	PLUNGERS.		Capacity		Speed and Capacity		Limit Pressure per Square Inch.	Suction.	Discharge.	Geared	Pulleys, Each.	Cipher.	*Price.
	Dia.	Stroke	One Rev. of Crank Shaft.		per Min., varying with Kind of Work and Pressure.								
A	1 in.	4 in.	9.4 cu. in.	.04 gals.	40 to 70 revs. — 1.6 to 2.8 gals.	1500 lbs.	1 1/4 in. pipe.	1 in. pipe.	5 to 1	15x3 in.	Classif		
B	2 3/4 "	6 "	7.9 "	.03 "	40 to 70 " — 1.2 to 2.1 "	5000 "	1 "	3/4 "	7 to 1	20x4 "	Cleare		
I	2 "	6 "	58.5 "	.24 "	40 to 70 " — 9.6 to 16 "	1500 "	2 "	1 1/2 "	5 to 1	30x5 "	Druid		
C	2 1/4 "	8 "	95 "	.41 "	40 to 60 " — 16 to 24 "	1500 "	3 "	2 "	5 to 1	36x6 1/2 "	Clima		
D	4 1/2 "	8 "	381 "	1.65 "	30 to 50 " — 49 to 82 "	400 "	3 "	3 "	5 to 1	36x6 1/2 "	Briefc		
E	6 1/2 "	8 "	796 "	3.44 "	25 to 50 " — 85 to 170 "	200 "	4 "	4 "	5 to 1	36x6 1/2 "	Briefly		
F	3 "	8 "	169 "	.73 "	30 to 50 " — 21 to 36 "	1500 "	3 "	2 "	5 to 1	42x6 1/2 "	Cloudin		
G	4 1/2 "	8 "	381 "	1.65 "	30 to 50 " — 49 to 82 "	600 "	3 "	3 "	5 to 1	42x6 1/2 "	Cabnoc		
H	6 1/2 "	8 "	796 "	3.44 "	25 to 50 " — 85 to 170 "	300 "	4 "	4 "	5 to 1	42x6 1/2 "	Cabless		

\* Prices upon application.



# GOULDS TRIPLEX HYDRAULIC PRESSURE PUMP.

FOR VARIABLE DELIVERY.

Fig. 1034 is a modification of our standard Triplex Power Pressure Pump, Fig. 997, opposite page. Instead of having three plungers identical in size and working power, one plunger is of larger diameter and greater displacement than the others. When used with a press or other hydraulic machine, the initial movement of the ram is made more rapidly by the combined delivery of the three plungers until a certain pressure is reached. Then an automatic device cuts out the larger plunger and the operation is continued by the smaller plungers to the desired pressure. The pressure on the larger plunger should not exceed 25 per cent. of the maximum pressure exerted by the Pump. Hydraulic Pressure Pumps of this form are particularly serviceable for baling presses, testing machines, etc., in mills and factories. In making inquiries or orders, state fully the service required of the Pump.

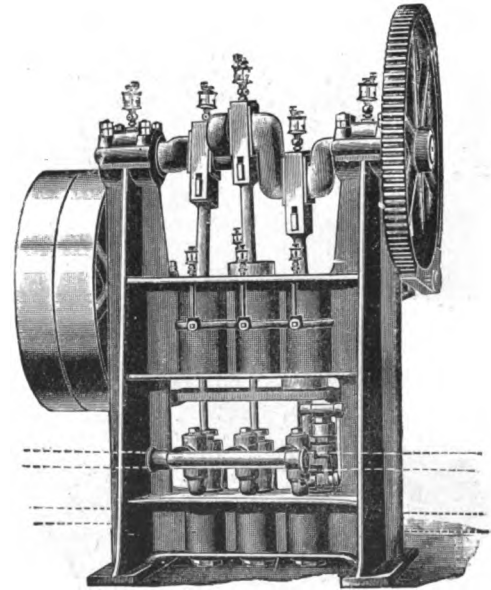


FIG. 1034.

FIG. 1034. SIZE, CAPACITY, ETC.

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Min., varying with Kind of Work and Pressure.	Limit Pressure per Sq. In.	Suction.	Discharge.	Pulleys, Each.	Cipher.	* Price.
Dia.	Stroke.								
$\frac{3}{4}$ in. and $1\frac{1}{2}$ in.	6 in.	15.8 cu. in. or 0.068 gals.	25 to 50 revs. 1.7 to 4 gals.	5000 lbs.	$\frac{3}{4}$ in. pipe.	$\frac{3}{4}$ in. pipe.	26 x 4 in. geared 7 to 1	Turf	

\* Price upon application.

# GOULDS TRIPLEX POWER AMMONIA PUMP.

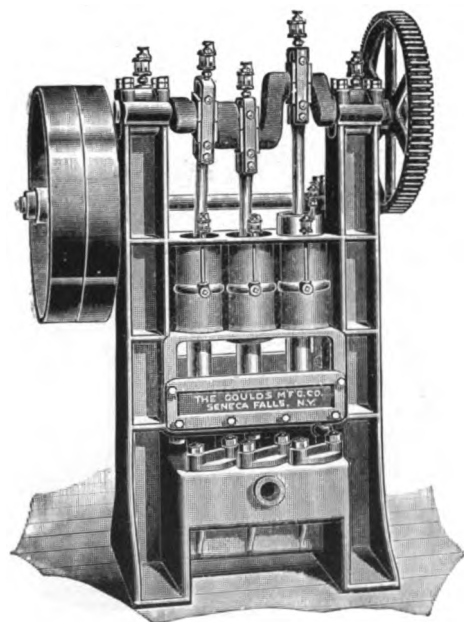


FIG. 999.

Fig. 999, Triplex Power Ammonia Pump, is constructed for pumping aqua ammonia in connection with refrigerating machinery for cold storage and ice-making plants, etc. This Pump runs uniformly, receiving and delivering the ammonia regularly and does its work properly at all times without being watched and adjusted. The joints and connections of the ammonia coils and piping are thus spared the shock and vexatious leakages incidental to the use of other types of Ammonia Pumps.

It has three single-acting, outside-connected and outside-packed plungers, it occupies but limited floor space and requires no special foundation. The plungers have water seal. The connecting rods have strap heads and phosphor-bronze boxes. The crank shaft is steel and runs in bronze bearings. These Pumps are built of material wholly unaffected by ammoniacal liquid and are proportioned to sustain the exacting and continuous service of refrigerating plants.

FIG. 999. SIZES, CAPACITIES, ETC.

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Min., varying with Kind of Work and Pressure.	Lhmt Pressure.	Suction.	Discharge.	Geared.	Pulleys. Each.	Cipher.	* Price.
Dia.	Stroke.									
1½ in.	4 in.	14.7 cu. in.— .06 gals.	35 to 50 revs.— 2 to 3 gals.	250 lbs.	1 in. pipe.	¾ in. pipe.	5 to 1	15 x 3 in.	Eatable	
1¾ "	6 "	49.6 " — .21 "	35 to 50 " — 7 to 10 "	250 "	1½ "	1 "	5 to 1	20 x 3 "	Keeping	
2½ "	6 "	88 " — .31 "	35 to 50 " — 10 to 15 "	250 "	1½ "	1½ "	5 to 1	24 x 3 "	Duskol	
3½ "	8 "	231 " — 1.0 "	35 to 50 " — 35 to 50 "	250 "	2 "	2 "	5 to 1	30 x 4 "	Easima	

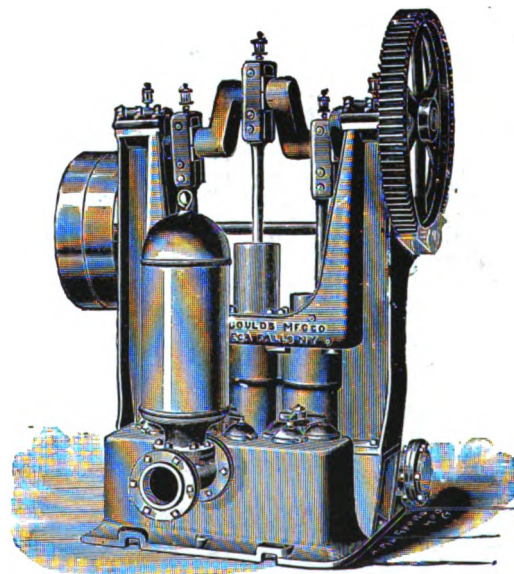
\* Prices upon application.

# GOULDS TRIPLEX POWER BRINE PUMP.

FOR ELEVATIONS TO 100 FEET OR EQUIVALENT PRESSURE.

**Fig. 1059**, Triplex Power Pump, is designed to circulate brine in refrigerating and cold storage plants, etc. It is of neat and compact design, well built and reliable. The gearing is machine cut; tight and loose pulleys; crank shaft in one piece; connecting rods have strap head at crank bearing with phosphor-bronze box, and bushed bearings in plungers; large valve area.

These Pumps are regularly fitted for pumping solutions of chloride of calcium, as a refrigerating medium, with iron plungers, cylinders, glands and rubber disk valves. These parts will be made of bronze, to order, if the Pump is to circulate solutions of common salt or other fluids destructive to iron. Always describe requirements as fully as possible.



**FIG. 1059.**

**FIG. 1059. SIZES, CAPACITIES, ETC.**

PLUNGERS.		Capacity, One Rev. of Crank Shaft.	Speed and Capacity per Min., varying with Kind of Work and Pressure.	Suction.	Discharge.	Geared.	Pulleys, Each.	Cipher.	*Price.
Dia.	Stroke.								
4 in.	6 in.	1 gal.	25 to 45 revs. — 24 to 44 gals.	2 in. pipe.	2 in. pipe.	5 to 1	20 x 3 in.	Boxhaul	
5 "	8 "	2 "	25 to 45 " — 50 to 90 "	3 "	3 "	5 to 1	30 x 5 "	Boxing	
7 "	8 "	4 "	20 to 45 " — 80 to 180 "	4 "	4 "	4 to 1	30 x 6 "	Boxiron	
8 "	10 "	6.5 "	20 to 40 " — 130 to 260 "	6 "	5 "	5 to 1	36 x 6 "	Boxkeep	
8 "	12 "	7.8 "	20 to 40 " — 156 to 312 "	6 "	5 "	5 to 1	36 x 6 "	Boxthor	

\* Prices upon application.

# GOULDS TRIPLEX POWER PUMP.

(For Semi-Fluids, etc.)

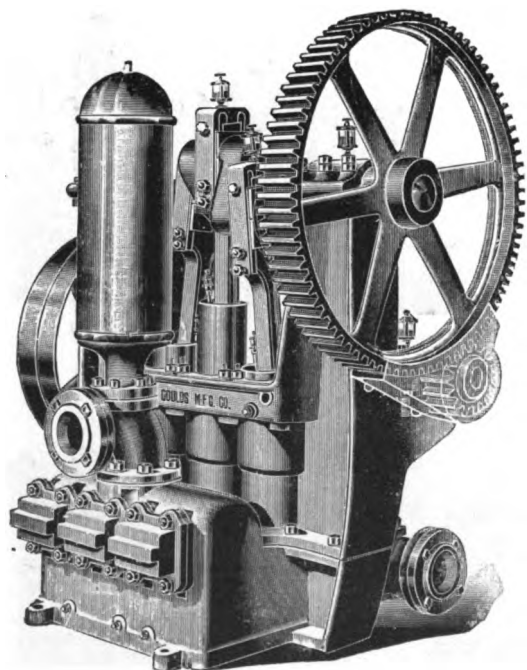


FIG. 948.

TO WORK AGAINST PRESSURES UP TO 100 POUNDS.

Fig. 948 is a special form of Triplex Power Pump originally designed and built for the Solvay Process Co., of Syracuse, N. Y. It has valves for pumping chemicals in solution, muddy water and semi-fluids. It is specially valuable where pumping without agitation is desirable. It will be found a useful Pump in many lines of manufacturing, and we solicit correspondence concerning it. One size now ready, other sizes in contemplation and can be furnished at short notice. Our regular construction provides iron cylinders, plungers and glands, though these parts can be made of other metal to order.

FIG. 948. SIZE, CAPACITY, ETC.

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Min., varying with Kind of Work and Pressure.	Suc.	Dis.	Geared.	Pulleys, Each.	Cipher.	* Price.
Dia.	Stroke.								
6½ in.	8 in.	3.4 gals.	25 to 40 revs. 85 to 136 gals.	4 in. pipe.	4 in. pipe.	5 to 1	30 x 6 in.	Vengean	

\* Price upon application.

# GOULDS TRIPLEX POWER PUMP. (For Semi-Fluids, etc.)

ELEVATIONS TO 100 FEET OR EQUIVALENT PRESSURE.

Fig. 1017, Triplex Power Pump, is designed to pump sewage, tan liquor, oils, chemicals in heavy solution, muddy water, tar, soap, etc.

It is fitted with valves best adapted for the service contemplated. The cylinders and plungers are iron or composition, as required and specified; with or without gear and pinion, according to conditions; tight and loose pulleys or single pulley.

It has a wide variety of applications, and we earnestly desire correspondents to carefully state the conditions under which the Pump is to operate, and what is required of it.

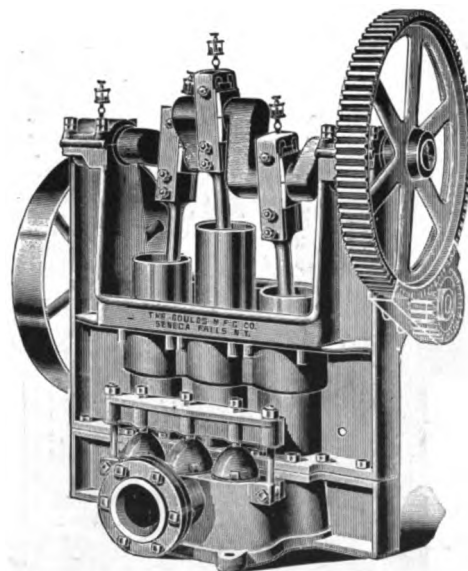


FIG. 1017.

FIG. 1017. SIZES, CAPACITIES, ETC.

PLUNGERS.		Capacity, One Rev. of Crank Shaft.	Speed and Capacity per Min., varying with Kind of Work and Pressure.	Suction.	Discharge.	Geared.	Pulley.	Cipher.	* Price.
Dia.	Stroke.								
4 in.	4 in.	.65 gal.	25 to 45 revs. — 16 to 29 gals.	3 in. pipe.	3 in. pipe.	5 to 1	20 x 3 in.	Surgent	
4 "	6 "	1 "	25 to 45 " — 24 to 44 "	3 "	3 "	5 to 1	20 x 3 "	Surgeon	
5 "	6 "	1.5 "	20 to 40 " — 30 to 60 "	4 "	4 "	4 to 1	20 x 4 "	Swack	
5 "	8 "	2 "	20 to 40 " — 40 to 80 "	4 "	4 "	4 to 1	20 x 4 "	Swiss	
7 "	8 "	4 "	20 to 40 " — 80 to 160 "	5 "	5 "	4 to 1	30 x 5 "	Switch	
8 "	10 "	6.5 "	20 to 40 " — 130 to 260 "	6 "	6 "	5 to 1	36 x 6 "	Tilting	
8 "	12 "	7.8 "	20 to 40 " — 156 to 312 "	6 "	6 "	5 to 1	36 x 6 "	Tinted	

\* Prices upon application.

# GOULDS TRIPLEX POWER AIR COMPRESSOR AND VACUUM PUMP.

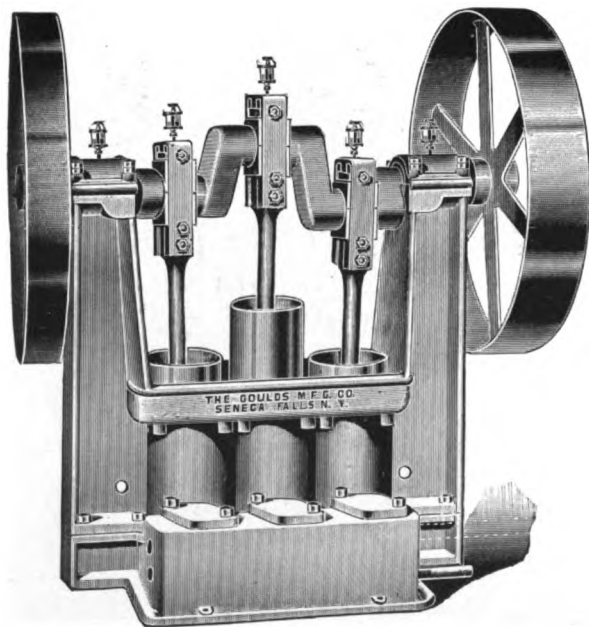


FIG. 1000.

Fig. 1000 is a good all around Vacuum Pump, simple, durable and strong. As a compressor it can be worked against pressures up to 20 pounds per square inch. It has no water-jacket for cooling the cylinders, consequently higher pressures are hardly practicable.

Its largest use is in oil refineries, chemical works, gas works, etc., for blowing out pipes, or circulating air or gases by pressure or vacuum. We give below table of capacity, etc. (estimated for sea level), for the size we now have to offer. Other sizes can be furnished at short notice.

FIG. 1000. SIZE, CAPACITY, ETC.

PLUNGERS.		Displacement One Rev. of Crank Shaft.		Speed and Displacement per Min., varying with the Kind of Work.	Suction.	Discharge.	Pulley.	Ctpher.	* Price.
Dia.	Stroke.								
8 in.	8 in.	1200 cu. in.	5.2 gals.	50 to 100 revs. — 250 to 500 gals.	2 in. pipe.	2 in. pipe.	36 x 6 in.	Ventil	

\* Price upon application.

## WATER WORKS, ELECTRIC LIGHT AND POWER.

Electrical engineers and capitalists are beginning to realize that their plants are but partially utilized, or stand idle too much of the time. Constant attention is necessary, and the plant must be held ready to meet instant demand for light and power. Boilers, engines and electric machinery are expensive; their hours of service must be increased and their work equalized. Electric pumping for municipal water supply and fire protection is being satisfactorily and profitably undertaken by electric light and power companies. It is more economical for small cities and towns to hire their pumping done electrically than to maintain a small steam plant with steam pumps.

Electric light and power companies buy coal; convert its heat energy into electric current through the medium of high class steam engines; conduct electric power in all directions; and sell it, at a profit, to the majority of power users, for less price than power can be developed locally by small steam plants.

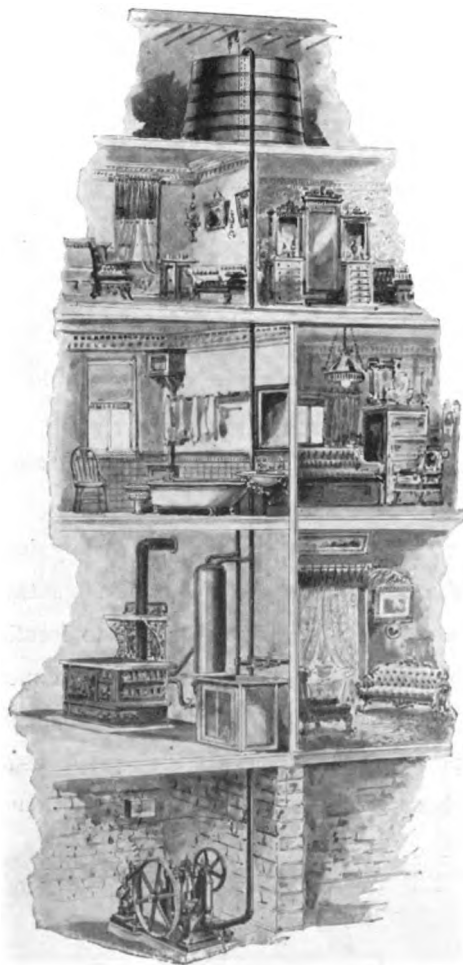
It costs less for current to pump electrically than for city water, or for coal for direct-acting steam pumps.

Also in such isolated plants as cotton and woolen mills, steel works, etc., and in fact in any large establishment where work is distributed over a large area, electric pumping can be used to great advantage. A steam pump in common use oftentimes requires transmission of steam through long lines of pipe to location of pump. This alone involves a large loss in condensation of steam. It has been found by actual experiment and demonstrated time and time again, that steam pumps are very wasteful in consumption of steam, using in actual service oftentimes 25 lbs. of coal per indicated horse power per hour. That high grade steam engines will develop power from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  indicated horse power per hour is undisputed, and transmission of electrical energy to electrical Pumps involves but a trifling loss.

We solicit correspondence on this head.

# GOULDS TRIPLEX ELECTRIC POWER PUMP.

FOR GENERAL SERVICE.



Pumping water for use in dwellings, hotels, business blocks, etc., by means of small isolated pumps, is a subject which has had a good deal of attention and study. It has brought forth a host of contrivances, such as gas and hot air engines, and special steam pumps. Among them all the Electric Power Pump is destined to stand pre-eminent because it is so simple and its operation so nearly automatic.

Driving by belt is a sure method and our arrangement is noiseless, so that pumping plants of this kind are operated in residences without the slightest annoying sound.

For this service of local electric pumping we recommend our **Fig. 932**, illustrated on page 216. It was designed specially for this class of work, though **Figs. 926, 975 and 934** are also used. Skilled attendance is not required. There is no odor, dust or ashes; no heat and no danger of explosion. When the tank is filled, the pump and motor stop; when the water in tank falls to a certain level they start up and run until the tank is again filled. Expense for electric current ceases the instant the motor stops.

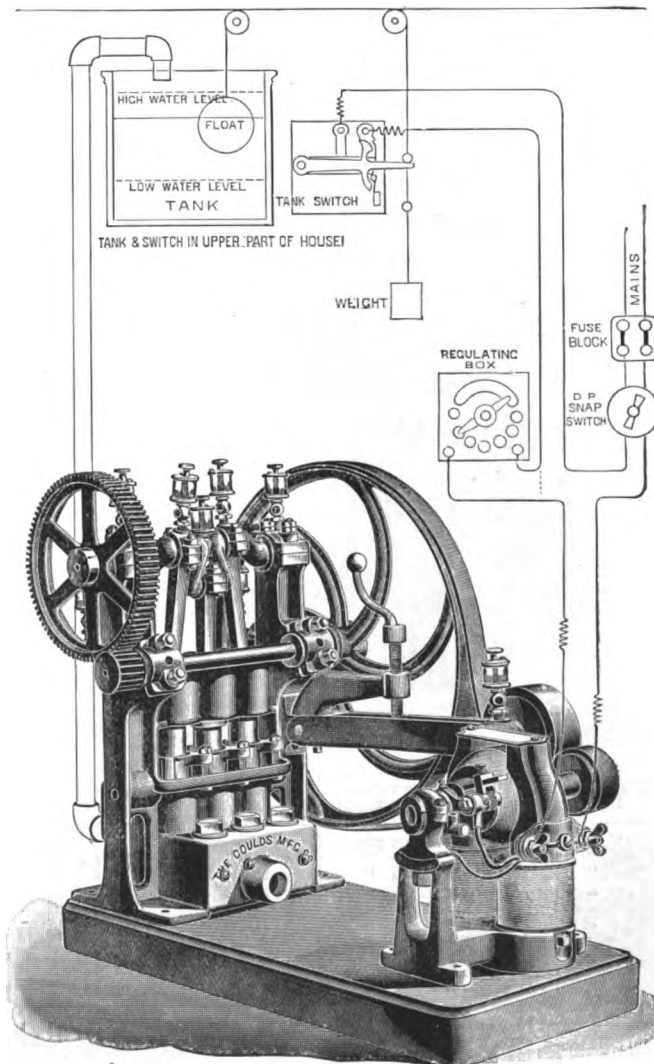


## METHOD OF CONTROLLING AND PIPING

### GOULDS TRIPLEX ELECTRIC POWER PUMP.

Electric Power Pumps are generally placed in the basement where it is convenient to make connection to the water to be pumped. The discharge pipe is run up through the building to the tank. A float follows the water level in the tank, thereby automatically opening and closing the switch which controls the electric current used by the motor. The illustration conveys a good general idea of how the apparatus is installed. There are various details which are readily worked out by the electrician and pipe fitter.

Many Electric Pumps do not have an automatic controlling device; the overflow pipe is simply run down through some portion of the building frequented by attendants, who stop the pump when overflow of water is noticed. We are always ready to give purchaser of these pumps the benefit of our experience as to best methods of placing and operating. Prices upon application.



# GOULDS TRIPLEX ELECTRIC POWER PUMP.

FOR ELEVATIONS TO 350 FEET OR EQUIVALENT PRESSURE.

FIG. 932.

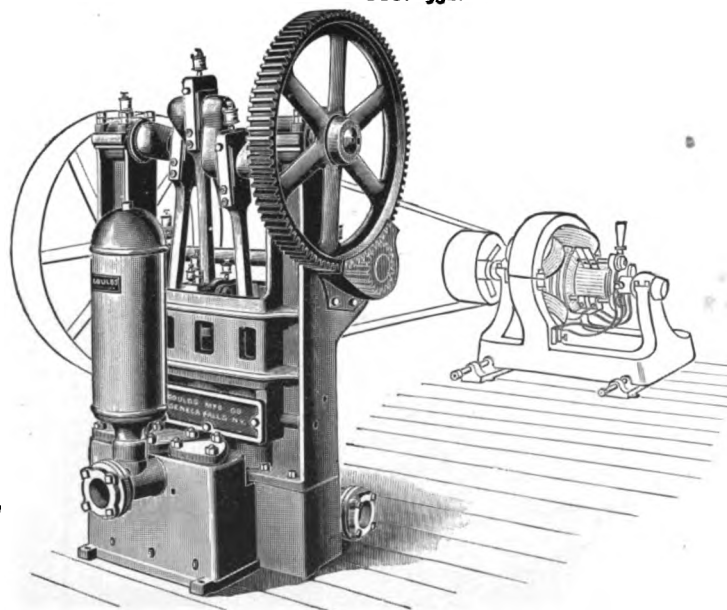


Fig. 932, Triplex Electric Power Pump, has three single-acting plungers attached to the connecting rods by means of cross-heads which sustain the side thrust of the connecting rods, permitting the plungers to operate without lateral pressure. The wear of the plungers, glands and packing is thus reduced to a minimum, and the cross-head guides and pins are accessible for attention. The rotating parts, bearings and valves are all of our standard design and materials.

Our regular construction is: iron plungers, cylinders, glands, rubber disk valves, and rawhide pinion. The driving pulley is not included on the Pump because so much variation in the pulley and speed of motors prevents having standard pulley sizes for the Pumps. We can, however, supply any sizes of pulleys at current market rates. In making orders please state speed, diameter and face of motor pulley. We show Belt Tightener specially adapted for this Pump on following page.

Illustration shows construction of Pumps 4" x 4" and larger.

FIG. 932. SIZES, CAPACITIES, ETC.

PLUNGERS.		Capacity, One Rev. of Crank Shaft.	Speed and Capacity per Minute, varying with Kind of Work and Pressure.	Suction.	Discharge.	Geared.	Cipher.	* Price.
Dia.	Stroke.							
1 1/4 in.	2 in.	.03 gal.	40 to 60 revs. — 1.2 to 1.8 gals.	1/4 in. pipe.	1/4 in. pipe.	5 to 1	Althorn	
1 1/2 "	2 1/2 "	.07 "	40 to 60 " — 2.8 to 4.2 "	1 "	1 "	5 to 1	Although	
2 "	3 "	.12 "	30 to 50 " — 3.5 to 6 "	1 1/4 "	1 1/4 "	5 to 1	Altimeter	
2 1/2 "	4 "	.25 "	30 to 50 " — 7.5 to 12 "	1 1/2 "	1 1/2 "	5 to 1	Altincar	
3 "	4 "	.36 "	30 to 50 " — 10.5 to 18 "	1 3/4 "	1 3/4 "	5 to 1	Altiscop	
4 "	4 "	.65 "	25 to 45 " — 16 to 29 "	2 "	2 "	5 to 1	Altitude	
4 "	6 "	1 "	25 to 45 " — 24 to 44 "	2 "	2 "	5 to 1	Alto	
5 "	6 "	1.5 "	25 to 45 " — 37 to 67 "	3 "	3 "	5 to 1	Altogeth	
5 "	8 "	2 "	25 to 45 " — 50 to 90 "	3 "	3 "	5 to 1	Altomet	

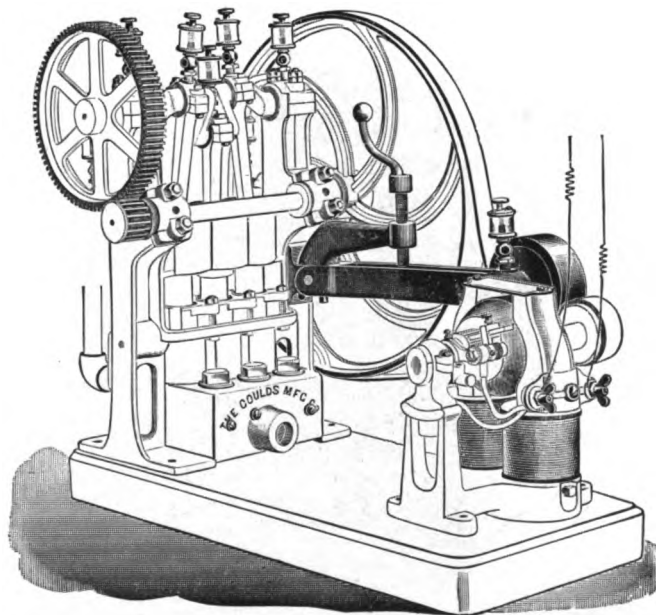
\* Prices upon application.

# GOULDS TRIPLEX PUMP BELT TIGHTENER.

ADAPTED FOR FIG. 932 TRIPLEX ELECTRIC POWER PUMP.

**Fig. 932 A** (parts shown in full line engraving) is designed for attaching to **Fig. 932** Triplex Electric Power Pump, described on opposite page. Our illustration shows Belt Tightener so attached. It consists of strong arm, securely bolted to pump frame with hinged extension, which can be adjusted to position by set screw with lever handle. This attachment is of special value on small Electric House Pumps. Pump and motor are in this manner brought close together, occupying smallest floor space. This idler pulley is also flanged to prevent belt from running off under high speeds.

In our table we specify several sizes of Pump to which this Belt Tightener is adapted.



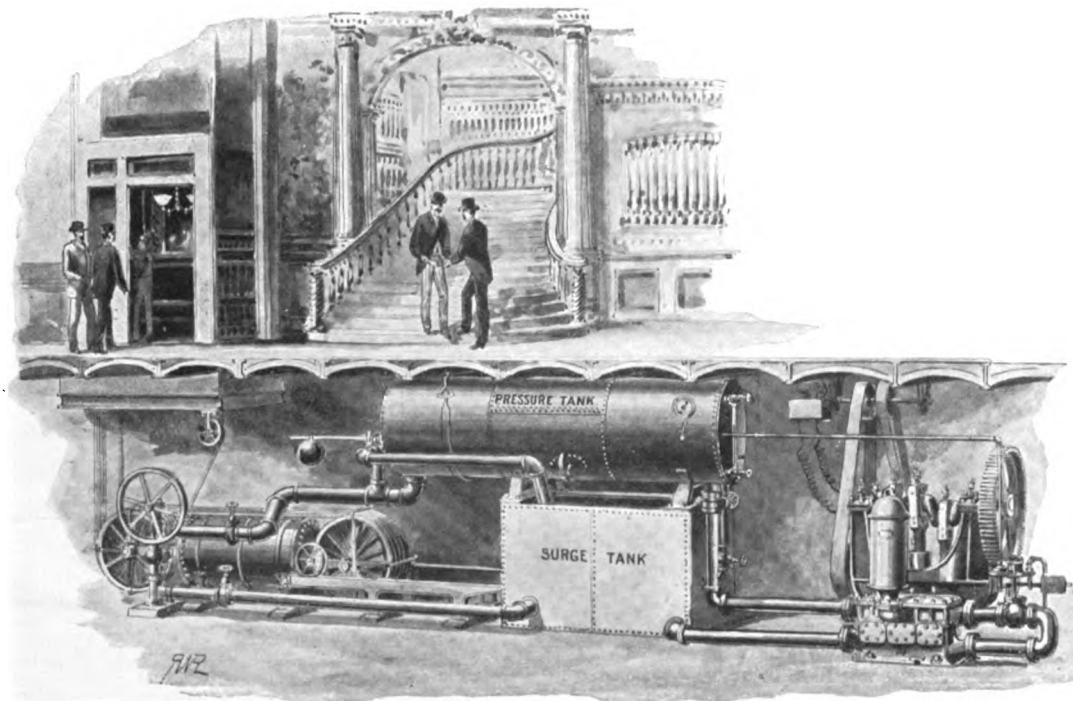
**FIG. 932 A. SIZES, ETC.**

No. 1 Belt Tightener adapted for Fig. 932			
" 2 " " " " " 932	1 1/4 x 2 in.	Dingot	* Price
" 3 " " " " " 932	1 3/4 x 2 1/2 "	Dingul	
" 4 " " " " " 932	2 x 3 "	Dinhath	
	2 1/2 x 4 "	Dinhig	

\* Prices upon application.

# GOULDS TRIPLEX PUMP FOR HYDRAULIC ELEVATORS.

PUMP AND MOTOR RUN CONTINUOUSLY. AUTOMATIC CONTROL



Busy elevators draw water from the compression-tank almost continuously, demanding almost constant service of the Pump. Under these conditions, it is better for the motor to run continuously than to be started at frequent intervals.

The picture shows the general arrangement of the motor, hydraulic apparatus, and the Pump, together with the controlling device, which consists of the automatic regulator and by-pass valve.

The discharge from the Pump is controlled by the pressure in the compression tank. The automatic regulator is adjusted to open the by-pass whenever limit pressure is reached and the by-pass is kept open until the pressure drops a little as the elevator is started. The by-pass then closes and the Pump discharges into the compression tank until the limit pressure is again reached.

By this system the Pump and motor are relieved of almost their entire load while the pressure in the compression tank is up to the limit, because the by-pass allows the discharge to run around into the inlet of the Pump with scarcely any pressure. The slight amount of current required to keep the motor and Pump in motion is less than would be required to frequently start them from a state of rest.

In making an installation of this kind, the pipe connections between Pump and compression tank are made in the customary manner. It is essential to have a relief valve, placed as shown in the illustration, to relieve the Pump and motor of over-load if for any reason the pressure should exceed the normal limit. We are prepared to supply everything required to complete an installation. Our **Fig. 926** (pages 220 and 221) is generally used for elevator work. **Fig. 934** (page 223) is sometimes used; also **Fig. 920** (pages 230 and 231) for the larger plants.

Electric pumping costs less than city water, or the coal required for direct-acting steam pumps.

*To enable us to recommend and estimate, we should be informed of:*

1. Number of gallons of water used per trip, or diameter and stroke of the hydraulic cylinder.
2. Pressure required to run the elevator.
3. Speed of car in feet per minute, or usual time required to make a round trip.
4. Is the elevator in constant service?
5. How many full trips (or the equivalent of full trips) does the elevator make in five or ten minutes when busiest?
6. Capacity or size of compression tank.

# GOULDS TRIPLEX ELECTRIC POWER PUMP.

FOR ELEVATIONS TO 300 FEET OR EQUIVALENT PRESSURE.

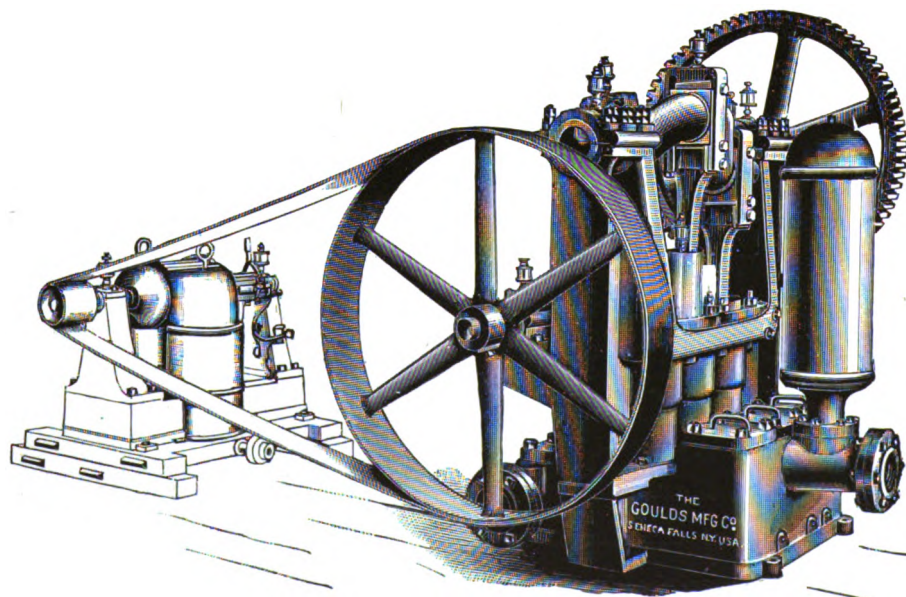


FIG. 926.

See opposite page for description, etc.

# GOULDS TRIPLEX ELECTRIC POWER PUMP.

FOR ELEVATIONS TO 300 FEET OR EQUIVALENT PRESSURE.

**Fig. 926,** Triplex Electric Power Pump, illustrated on opposite page, is our standard type and designed to carry pulley driven with belt by electric or other motor. Pump and motor require no special foundation. They may be placed upon any stable support 10 or 12 feet apart. Pump has large valve area, which insures efficiency and smooth running at high speed. In Pumps 4" x 4" and larger, each connecting rod has bronzed bushed bearing in plunger and strap head at crank with phosphor-bronze box, with adjustment for wear. Gear is machine cut and pinion rawhide with bronze shroud. Our regular construction is iron plungers, cylinders, glands and bronze valves with rubber disks for cold water. Working parts may be made of bronze or other material to order. Driving pulley for Pump will not be included in our regular prices, because wide variation of speed of motor prevents our establishing standard sizes. We shall, however, be pleased to supply at regular market rates.

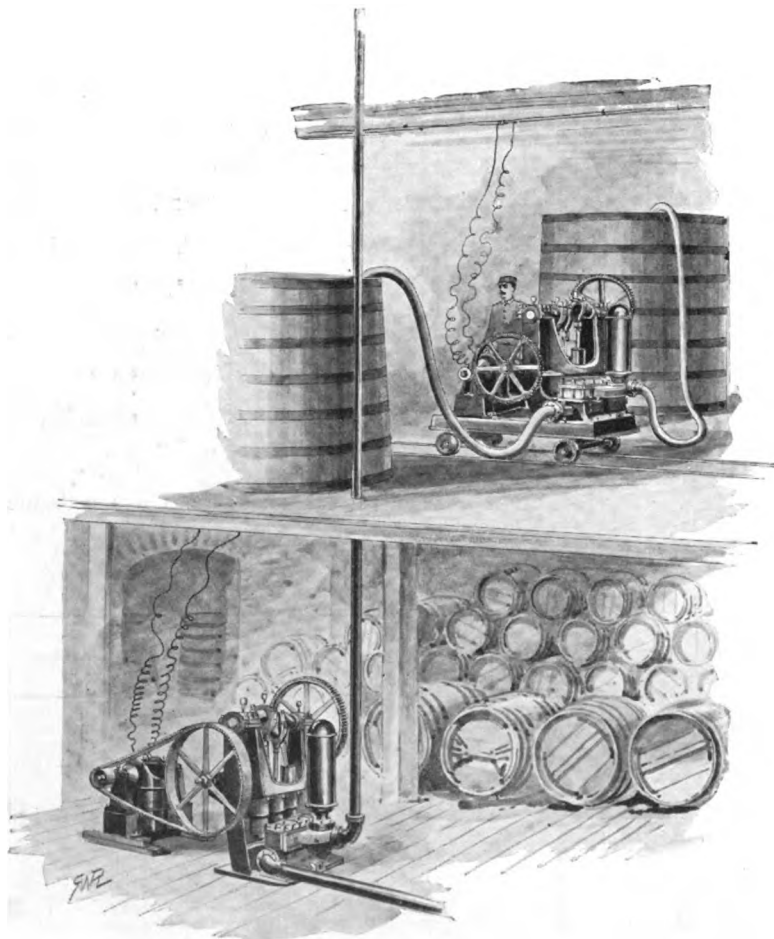
In making orders, please state speed, diameter and face of motor pulley, from which we can estimate proper size of Pump pulley.

**FIG. 926. SIZES, CAPACITIES, ETC.**

PLUNGERS.		Capacity, One Rev. of Crank Shaft.	Speed and Capacity per Min., varying with Kind of Work and Pressure.	Suction.	Discharge.	Geared.	Cipher.	* Price.
Dia.	Stroke.							
1½ in.	2 in.	.03 gal.	40 to 60 revs. — 1.2 to 1.8 gals.	¾ in. pipe.	¾ in. pipe.	5 to 1	Worship	
1¾ "	2½ "	.07 "	40 to 60 " — 2.8 to 4.2 "	1 in. "	1 in. "	5 to 1	Worsta	
2 "	3 "	.12 "	30 to 50 " — 3.5 to 6 "	1½ "	1½ "	5 to 1	Worsted	
2½ "	4 "	.25 "	30 to 50 " — 7.5 to 12 "	1½ "	1½ "	5 to 1	Wortal	
3 "	4 "	.36 "	30 to 50 " — 10.5 to 18 "	1½ "	1½ "	5 to 1	Worth	
4 "	4 "	.65 "	25 to 45 " — 16 to 29 "	2 "	2 "	5 to 1	Worthyn	
4 "	6 "	1 "	25 to 45 " — 24 to 44 "	2 "	2 "	5 to 1	Wotand	
5 "	6 "	1.5 "	25 to 45 " — 37 to 67 "	3 "	3 "	5 to 1	Wote	
5 "	8 "	2 "	20 to 40 " — 40 to 80 "	3 "	3 "	5 to 1	Woul	
6½ "	8 "	3.4 "	20 to 40 " — 68 to 136 "	4 "	4 "	5 to 1	Wouled	
8 "	8 "	5.2 "	20 to 40 " — 104 to 208 "	5 "	4 "	5 to 1	Wound	
8 "	10 "	6.5 "	20 to 40 " — 130 to 260 "	5 "	4 "	5 to 1	Woundye	
9 "	10 "	8.2 "	20 to 40 " — 164 to 328 "	6 "	5 "	6 to 1	Zunis	

\* Prices upon application.

## ELECTRICITY FOR MISCELLANEOUS PUMPING.



A portable Pump is a handy thing, specially if it is mounted on a truck so that it can be easily moved from one place to another; but when it comes to pumping by hand, hour after hour, it costs too much and the operation is too slow.

Our Electric Pumps are as convenient to move about as hand Pumps; they are tireless and work fast. The moment the work is done the current is shut off and the expense ceases.

Our **Fig. 934** (page 223) is an admirable portable Pump. The small sizes deliver only a few gallons per minute; the larger ones several hundred gallons. The Pump and motor are always mounted on a base-plate, called the motor-base. The small outfits can be picked up and carried anywhere; the larger ones can be placed on a truck, drawn around by hand, and carried from one story of the building to another on the elevator.

**Fig. 926**, described on pages 220 and 221, is capable of almost limitless adaptations about Mills, Breweries, Distilleries, etc.



# GOULDS TRIPLEX ELECTRIC POWER PUMP.

FOR ELEVATIONS TO 300 FEET OR EQUIVALENT PRESSURE.

Fig. 934, Triplex Electric Power Pump, is furnished complete with motor-base and intermediate gearing for any make or type of motor. Power of motor is transmitted from armature shaft by pinion engaging with intermediate gear on the pinion shaft of the pump. Gears and pinions are machine cut. Rawhide pinions run more quietly than bronze, and are regularly furnished, but we can supply bronze pinions if required for damp places. The design and construction of Fig. 934 is identical in other respects with Fig. 926, described on pages 220 and 221.

In making orders, we should be given general dimensions of motor (or, preferably, working drawing), diameter and speed of armature shaft, and height above base. See preceding pages for applications. Illustration shows construction of Pumps 4" x 4" and larger.

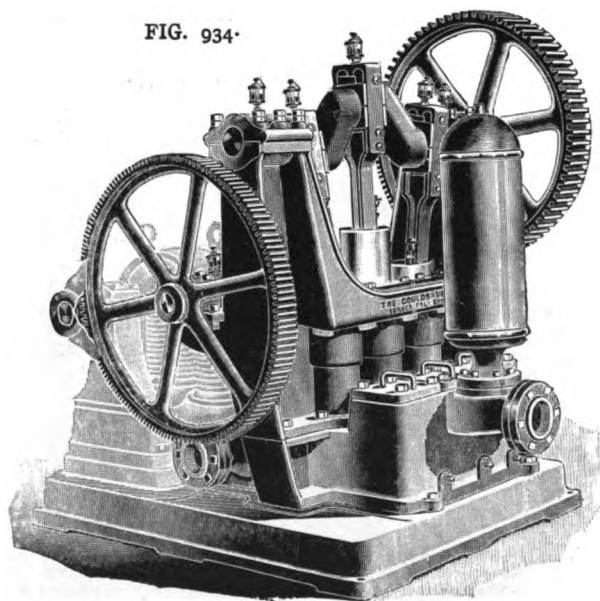


FIG. 934. SIZES, CAPACITIES, ETC.

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Min., varying with Kind of Work and Pressure.	Suction.	Discharge.	Crank Shaft and Pump Pinion Geared.	Cipher.	* Price.
Dia.	Stroke.							
2 in.	3 in.	.12 gal.	30 to 50 revs.— 3.5 to 6 gals.	1 1/4 in. pipe.	1 1/4 in. pipe.	5 to 1	Wimbla	
2 1/2 "	4 "	.25 "	30 to 50 " — 7.5 to 12 "	1 1/2 "	1 1/2 "	5 to 1	Wimple	
3 "	4 "	.36 "	30 to 50 " — 10.5 to 18 "	1 3/4 "	1 3/4 "	5 to 1	Wince	
4 "	4 "	.65 "	25 to 45 " — 16. to 29 "	2 "	2 "	5 to 1	Wink	
4 "	6 "	1. "	25 to 45 " — 24 to 44 "	2 "	2 "	5 to 1	Winnow	
5 "	6 "	1.5 "	25 to 45 " — 37 to 67 "	3 "	3 "	5 to 1	Wisel	
5 "	8 "	2. "	20 to 40 " — 40 to 80 "	3 "	3 "	5 to 1	Wished	
6 1/2 "	8 "	3.4 "	20 to 40 " — 68 to 136 "	4 "	4 "	5 to 1	Wode	
8 "	8 "	5.2 "	20 to 40 " — 104 to 208 "	5 "	4 "	5 to 1	Withy	
8 "	10 "	6.5 "	20 to 40 " — 130 to 260 "	5 "	4 "	5 to 1	Zuga	
9 "	10 "	8.2 "	20 to 40 " — 164 to 328 "	6 "	5 "	6 to 1	Zugos	

\* Prices upon application.

# GOULDS TRIPLEX ELECTRIC POWER PUMP.

FOR ELEVATIONS TO 100 FEET OR EQUIVALENT PRESSURE.

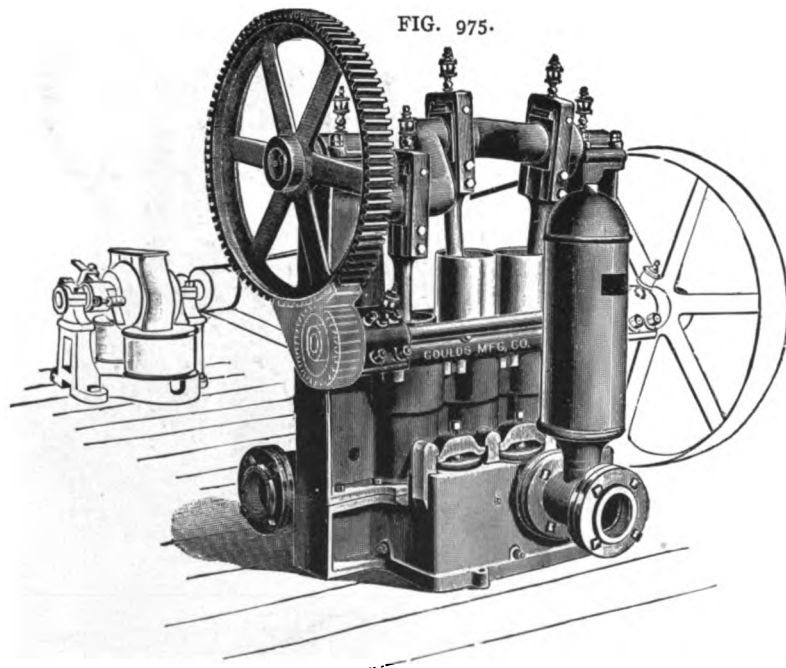


FIG. 975.

**Fig. 975** is our Light Service Triplex Electric Power Pump, to be fitted with pulley and driven with a belt by electric or other motor. It closely resembles **Fig. 926** (pages 220 and 221) in general design, and it is regularly fitted up in the same manner.

It is well adapted to hydraulic elevators, operated on the open roof-tank system; water supply for towns, for manufacturing purposes, for breweries, etc., and will be fitted, when so ordered, for pumping fluids of any kind.

Price does not include pulley on Pump or the motor, but can supply at market rates.

Always state speed, diameter and face of motor pulley.

**FIG. 975. SIZES, CAPACITIES, ETC.**

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Min., varying with Kind of Work and Pressure.	Suction.	Discharge.	Geared.	Clpher.	* Price.
Diameter.	Stroke.							
7 in.	8 in.	4 gals.	30 to 50 revs. — 120 to 200 gals.	4 in. pipe.	4 in. pipe.	4 to 1	Wrest	
8 "	10 "	6.5 "	30 to 45 " — 195 to 290 "	6 "	5 "	5 to 1	Wrester	
8 "	12 "	7.8 "	25 to 40 " — 195 to 310 "		5 "	5 to 1	Wrestlo	

\* Prices upon application.

# GOULDS VERTICAL TRIPLEX ELECTRIC MINE PUMP.

FOR ELEVATIONS TO 350 FEET OR EQUIVALENT PRESSURE.

Fig. 968 is similar in form to our standard Triplex Electric Pump, Fig. 934 (page 223). The working parts exposed to the fluid pumped are phosphor-bronze. The valves and bearings are all quickly accessible. The plungers are outside packed. The gearing is machine cut and runs quietly.

The Pump and motor are both mounted on a heavy cast-iron motor base. This form combines strength with convenience and compactness. The motor base, intermediate gear, and a bronze pinion for motor shaft are included with the Pump.

We can adapt Pump for any make motor if given general dimensions (or preferably working drawings), diameter and speed of armature shaft, and height above base. See application, page 226.

FIG. 968.

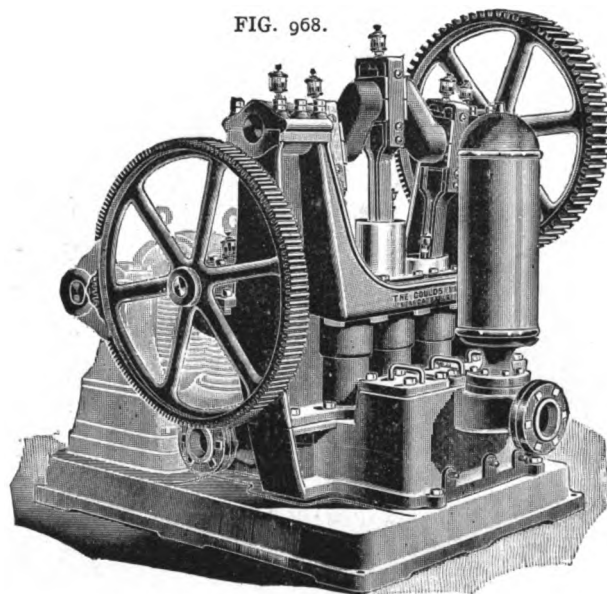
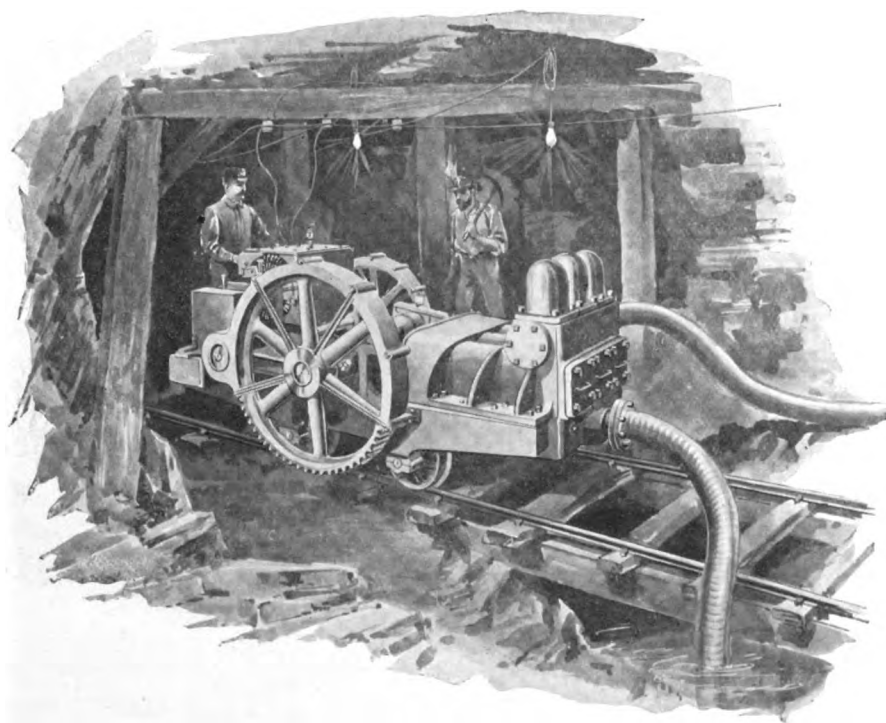


FIG. 968. SIZES, CAPACITIES, ETC.

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Minute, varying with Kind of Work and Pressure.	Suction.	Discharge.	Crank Shaft and Pump Pinion Geared.	Cipher.	* Price.
Diameter.	Stroke.							
4 in.	4 in.	.65 gal.	25 to 45 revs. — 16 to 29 gals.	2 in. pipe.	2 in. pipe.	5 to 1	Wowf	
4 "	6 "	1 "	25 to 45 " — 24 to 44 "	2 "	2 "	5 to 1	Wotad	
5 "	6 "	1.5 "	25 to 45 " — 37 to 67 "	3 "	3 "	5 to 1	Zufo	
5 "	8 "	2 "	20 to 40 " — 40 to 80 "	3 "	3 "	5 to 1	Wote	
6½ "	8 "	3.4 "	20 to 40 " — 68 to 136 "	4 "	4 "	5 to 1	Wotend	
8 "	8 "	5.2 "	20 to 40 " — 104 to 208 "	5 "	4 "	5 to 1	Wrack	
8 "	10 "	6.5 "	20 to 40 " — 130 to 260 "	5 "	4 "	5 to 1	Zyme	
9 "	10 "	8.2 "	20 to 40 " — 164 to 328 "	6 "	5 "	5 to 1	Zymic	

\* Prices upon application.

## ELECTRICAL MINE PUMPING.



The general application of electricity for mine operation in lighting, operating fans, haulage locomotives, drills, etc., makes Electric Pumps only a part of the general system; nor should this item of pumping be underestimated when the best authorities concur that on an average, seven tons of water are pumped for every ton of coal mined. Heretofore, it is well known, this pumping has been generally performed with steam pumps, steam being generated at the surface and transmitted below for operating the Pumps. By electrical transmission, pumping can be done at places where heretofore it has been impossible to operate steam pumps from the long distance which the steam must necessarily be conveyed, and because of the small space occupied by the Electric

Pump in comparison with the large, cumbersome steam pump.

Our illustration shows our Horizontal Triplex Electric Mine Pump mounted on truck, pumping water from drift back to base of mine shaft. This Pump is specially designed to go in shallow cuts, and working parts made of metal unaffected by action of water in mines. Notice the exposed parts are protected by covers or guards from falling debris.

We also make a Vertical Triplex Electric Mine Pump for pumping water from base of mine shaft to Pump and from this point to surface. The control and operation of these Pumps can be entirely automatic, if desired.

Illustrations and detailed descriptions of these Pumps will be found, pages 225 and 227.

# GOULDS HORIZONTAL TRIPLEX ELECTRIC MINE PUMP.

FOR ELEVATIONS TO 300 FEET OR EQUIVALENT PRESSURE.

Fig. 966, Horizontal Electric Mine Pump, is mounted on a truck to facilitate moving it about in the mine.

The plungers are phosphor-bronze and outside packed. The cylinders and glands are bronze lined. The gearing is machine cut and runs quietly. The motor pinion is bronze. The crank bearings are phosphor-bronze with adjustment for taking up wear.

We furnish Pump complete with truck and intermediate gearing to connect to motor. Motor is not included in price, but can be furnished to order.

We should always be furnished working drawing of motor, speed, etc., also advised width of track. See application, page 226.

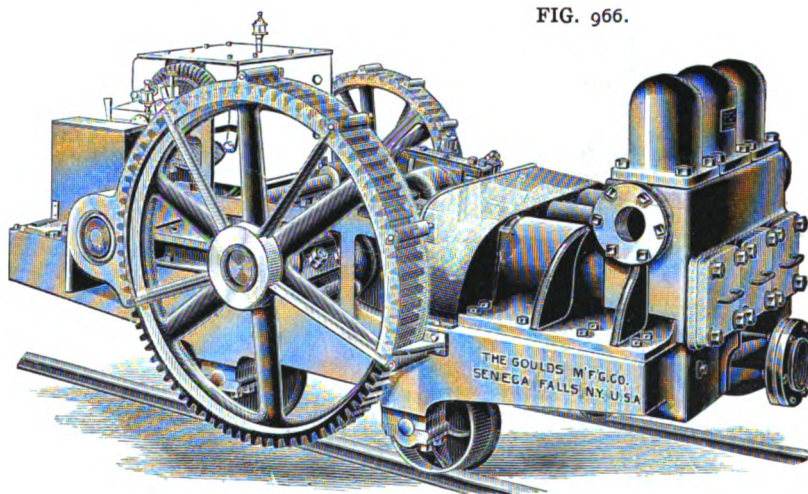


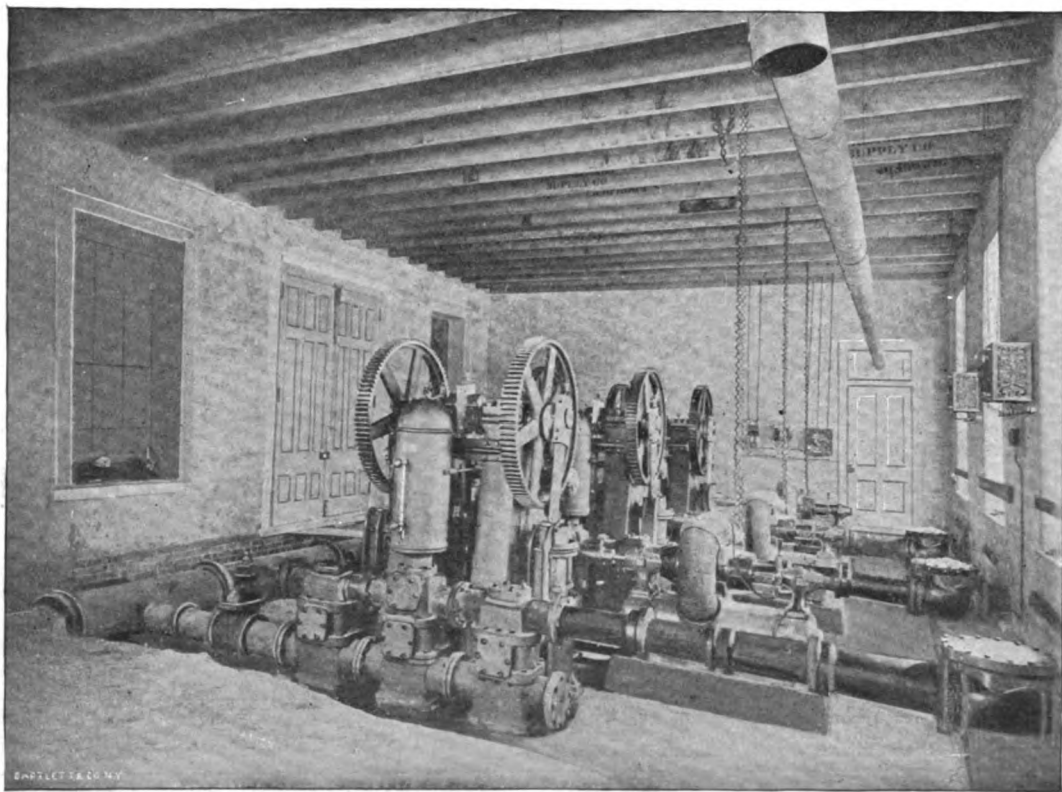
FIG. 966. SIZES, CAPACITIES, ETC.

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Speed and Capacity per Min., varying according to Kind of Work and Pressure.	Suction.	Discharge.	Crank Shaft and Pump Pinion Geared.	Cipher.	* Price.
Dia.	Stroke.							
5 in.	8 in.	2 gals.	20 to 40 revs. — 40 to 80 gals.	3 in. pipe.	3 in. pipe.	5 to 1	Briefer	
6½ "	8 "	3.4 "	20 to 40 " — 68 to 136 "	4 " "	4 " "	5 to 1	Baldest	
8 "	8 "	5.2 "	20 to 40 " — 104 to 208 "	5 " "	4 " "	5 to 1	Brimful	

\* Prices upon application.

# GOULDS ELECTRIC WATER WORKS PUMPS.

AT SAN ANTONIO, TEXAS.



For description see opposite page.

# OPERATING ELECTRIC WATER WORKS PUMPS AT SAN ANTONIO, TEX.

*From "The Electrical Engineer."*

**"A**N interesting and important city electric pumping plant was installed last January by The Goulds Manufacturing Company, of Seneca Falls, N. Y., at San Antonio, Tex., for the Water Works Company of that city. Our illustration represents the inside of the pump house. The plant consists of three large Triplex Pumps known as Goulds "Fig. 920." These Pumps are duplicates, each having three outside-packed plungers, 10 inches diameter x 12-inch stroke. Each pump is connected by gearing to a 30 h. p. 500 volt C. & C. Electric Motor. The combined capacity of these Pumps is 2,250,000 gallons per day.

The pump house is on Market street in the business part of the city and the water supply is from four 8-inch artesian wells flowing into a standpipe. The water rises in the standpipe to a height of about 45 feet, giving a pressure of 19 pounds at its base.

At the left in the illustration is seen a 20-inch pipe which is connected to the standpipe that is just outside of the pump house. The water flows from this pipe to each Pump through a separate valve and is discharged through the 10-inch check valve shown at the right, into a 20-inch pipe connected with the city mains.

The plant is intended to supplement the city supply. The two other pumping stations are at a considerable distance, being about three miles from the business centre, and the water pumped by these Electric Pumps put into the mains in the immediate vicinity of the principal buildings will materially help to keep up the pressure in case of fire.

The four wells are from 840 to 870 feet deep and are all within 100 feet of the pump house. The water flows clear and sparkling, and gives to San Antonio the distinction of having the purest and most abundant water supply of any place in Texas. In the case of an epidemic such as cholera the supply could be cut off at the head of the river and taken entirely from these wells, excluding any possibility of pollution of the city water.

The power is taken at present from the Electric Light and Power Station, but eventually the water wheels, which run the Pumps at the head of the river stations, may be used to run electric generators and the power be transmitted electrically to the city stations.

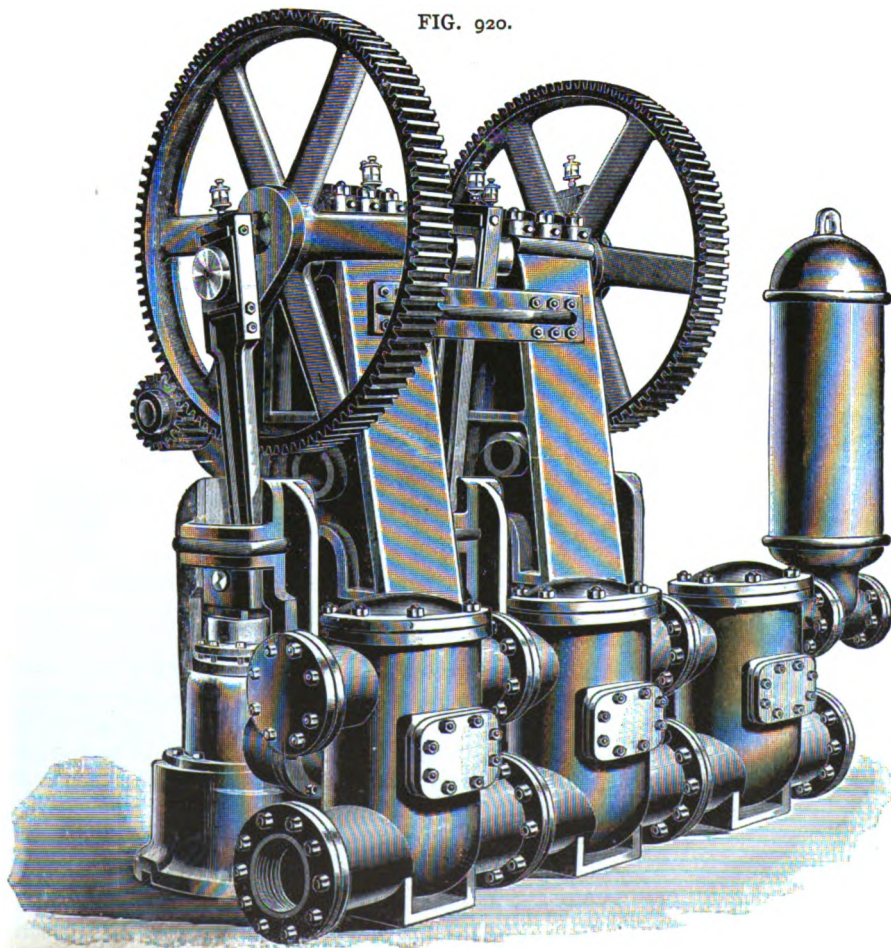
Mr. George W. Breckenridge, President of the Water Works Company, is a thorough business man, and has always shown himself willing to keep fully abreast of the times in introducing improvements. He was the first to use electricity in San Antonio, having installed a small dynamo several years ago which still furnishes current for the lights throughout his fine residence. In this plant the Water Works Company has the first of its kind and the largest water works pumping station operated by electricity in this country."

Since the publication of the above we have made other installations, and shall be pleased to furnish specifications and proposal upon any electric pumping plant. Fig. 920 is illustrated and described on following pages.



# GOULDS TRIPLEX POWER WATER WORKS PUMP.

FIG. 920.



See opposite page for description, etc.



# GOULDS TRIPLEX POWER WATER WORKS PUMP.

**Fig. 920**, Vertical Triplex Power Pump, is designed for water works, hydraulic elevator service, water supply for manufacturing purposes, etc. It may be belted or geared direct to electric motor, water wheel, steam, gas or petroleum engine.

The design and construction of this Pump embody all the features contributing to high efficiency, durability and strength. It has three single-acting plungers, outside packed, guided and connected. The cross heads have bronze shoes. Each connecting-rod has strap head with bronze box at crank and bronze bearing of the marine type at cross head. The valve area is ample for fast running and large delivery. Each group of suction and discharge valves is conveniently accessible through hand holes.

It is double geared; the gearing is machine cut; the pinions are iron, bronze or rawhide as best suited to intended service. A driving gear or pulley may be mounted on the pinion shaft between the bearings or at either end of the Pump (the shaft being extended for that purpose) if so ordered.

Our regular construction is: iron plungers, cylinders, glands and bronze valves, rubber disks for cold water. These parts of other material to order.

We have built, during the past few years, a large number of Pumps of this class for water works and hydraulic elevator service. See application, pages 228 and 229.

**FIG. 920. SIZES, CAPACITIES, ETC.**

PLUNGERS.		Capacity One Rev. of Crank Shaft.	Limit Pressure per Square Inch.	Speed and Capacity per Minute, varying with Kind of Work and Pressure.	Suction.	Discharge.	Geared.	Cipher.	* Price.
Dia.	Stroke.								
10 in.	12 in.	12.2 gals.	150 lbs.	25 to 41 revs. — 300 to 500 gals.	8 in. pipe.	7 in. pipe.	5 $\frac{1}{2}$ to 1	Woven Clubka Clubkih	
11 "	12 "	14.8 "	125 "	25 to 41 " — 370 to 600 "	10 "	8 "	5 $\frac{3}{4}$ to 1		
12 "	12 "	17.6 "	100 "	25 to 40 " — 440 to 700 "	10 "	8 "	5 $\frac{3}{4}$ to 1		

\* Prices upon application.

## TABLE OF POWER REQUIRED TO OPERATE GOULDS TRIPLEX POWER PUMPS.

The estimates given in the table are a liberal allowance of power. The power for other capacities and heights is, approximately, in proportion to that tabulated. Closer estimates will be given upon application. By "head" is meant the vertical distance from surface of water supply to point of delivery. One foot head is equivalent to .43 pounds pressure. The head is increased by the friction of the water in the pipes and elbows. To estimate this see "Friction of Water in Pipes," page 334.

Diameter and Stroke of Pump.	Capacity at 40 Revs. per Min. of Crank Shaft.	50 Feet Head or 22 Pounds Pressure.	100 Feet Head or 43 Pounds Pressure.	150 Feet Head or 65 Pounds Pressure.	200 Feet Head or 87 Pounds Pressure.	300 Feet Head or 130 Pounds Pressure.
1¼" x 2"	1 gals.	.20 h. p.	.24 h. p.	.28 h. p.	.32 h. p.	.40 h. p.
1¾" x 2½"	3 "	.25 "	.35 "	.4 "	.50 "	.65 "
2" x 3"	5 "	.3 "	.50 "	.65 "	.80 "	1 "
2½" x 4"	10 "	.5 "	.85 "	1 "	1.25 "	1.7 "
3" x 4"	13 "	.65 "	.90 "	1.25 "	1.6 "	2.25 "
4" x 4"	25 "	1 "	1.25 "	1.75 "	2 "	3 "
4" x 6"	40 "	1.5 "	2 "	2.5 "	3 "	4.5 "
5" x 6"	60 "	1.75 "	3 "	3.5 "	4.5 "	6 "
5" x 8"	80 "	2.5 "	4 "	4.75 "	5.5 "	8.25 "
6½" x 8"	135 "	3.5 "	5.5 "	7 "	9 "	13.5 "
8" x 8"	210 "	5.25 "	8 "	10 "	13.5 "	20 "
8" x 10"	260 "	7 "	10.5 "	13.75 "	18.25 "	26 "
9" x 10"	330 "	8.25 "	12.5 "	16.5 "	22 "	31 "

The tests on next page were made at the works of the Thomson-Houston Co., Lynn, Mass., in 1891. Improved pumps and motors now give better results. By "Electrical H. P." is meant the total current put into the motor; "Mechanical H. P." is the power required to deliver the given quantities of water against the given pressures, or heads, without considering friction or other losses; "Efficiency" is the ratio of the "Mechanical" to the "Electrical" H. P., *i. e.*, the efficiency of the combination of pump and motor. The results given for the 10 x 12 Pump are independent of the motor. The efficiency of electric motors is highest when running at full load. The efficiency of the Pumps is highest when operating against the heavier pressures.

# TESTS OF TRIPLEX POWER PUMPS AND MOTORS.

SHOWING ACTUAL CAPACITY, POWER, EFFICIENCY, ETC.

	Pressure, Lbs.	Head, Feet.	Volts.	Amperes.	Electrical H. P.	R. P. M. Pump Cr'k Sh'ft.	Mechanical H. P.	Efficiency, Per Cent.	Gallons per Minute.		Slip, per Cent.
									Actual.	C'leulat'd.	
4" x 4" TRIPLEX PUMP and 3-H. P. Motor.	150	350.5	238	13.3	4.24	43.9	2.52	59.5	28.4	28.6	.70
	125	291	240	11.2	3.70	45.2	2.14	58	29.2	29.6	1.2
	100	233.5	242	9.40	3.05	46	1.76	57.6	29.8	30	.66
	75	175.5	242	7.67	2.48	46.4	1.36	54.8	30.8	30.3	.16
	50	118	244	6.17	2.02	47	.908	44.9	30.6	30.7	.33
	25	60.2	239	4.45	1.43	47.3	.467	32.6	30.8	30.9	.32
	0	0	241	3.31	1.07	48					
			220	1.4	.412						
								Motor Alone			
	150	351.5	217	18.5	5.37	37.5	3.22	60	38.50	38.75	.7
	125	292	217	16.2	4.68	38.1	2.74	58.5	37.2	37.05	.25
	100	234.5	219	13.7	4.04	38.55	2.18	51.5	36.75	37.75	*2.6
4" x 6" TRIPLEX PUMP and 5-H. P. Motor.	75	176.5	221	11.8	3.49	39.1	1.66	47.5	37.3	38.3	*2.6
	50	119	219	9.3	2.73	39.15	1.14	41.8	37.98	38.3	.91
	25	61.2	220	7	2.06	40.3	.591	28.7	38.2	38.5	.78
	0	0	222.5	5.5	1.64	40					
			220	3.2	.942						
								Motor Alone			
	150	351.5	223	28.5	8.52	42.6	5.72	67.1	64.65	65.35	1
	125	292	222	25	7.43	45.2	4.92	66.3	66.7	69.2	3.5
	100	234.5	222	21	6.25	45.15	4	64	67.55	69	2
	75	176.5	222	17	5.06	45.75	3.12	61.5	69.7	70	.4
	50	119	222	13.4	3.94	45.5	2.08	52.7	69.05	69.61	.8
	25	61.2	223	9.4	2.81	45.75	1.08	38.1	69.05	70	.8
5" x 6" TRIPLEX PUMP and 7½-H. P. Motor.	0	0	221	6.1	1.81	50	0				
			220	4.8	1.41						
								Motor Alone			
	140	326	223	50.8	15.2	37.6	10.82	71.1	129	129.7	.54
	115	268.8	224	42.4	12.7	38	8.84	69.6	130.1	131	.69
	90	210	224	34.5	10.35	38.3	6.98	67.4	131.5	132.1	.45
	65	153	224	26.6	7.97	38.8	5.14	64.5	132.9	134	.82
	40	95	226	20	6.05	38.8	3.20	52.8	133.5	134	.37
	15	37	223	12.6	3.76	38.2	1.23	32.7	132.2	132.5	.23
	0	0	226.2	10.2	3.09	39					
			230	5	1.54						
								Motor Alone			
6½" x 8" TRIPLEX PUMP and 15-H. P. Motor.	150	351	228	76.4	23.3	36.1	16.7	71.8	188.1	188.5	.22
	125	291.5	236	65	20.6	37.3	14.3	69.3	193.8	194.8	.46
	100	234	236	57.5	16.3	37.2	11.4	70	193.7	194.2	.26
	75	176	240	41.2	13.3	37.4	8.65	65	194.6	195.2	.31
	50	118.5	236	31.5	9.96	37.4	5.83	58.5	194.3	195.2	.47
	25	60.7	240	21.7	6.98	37.9	2.99	42.8	197.4	198	.30
	0	0	246	10.5	3.46	38.4					
			235	6	1.89						
								Motor Alone			
	150	351	228	76.4	23.3	36.1	16.7	71.8	188.1	188.5	.22
	125	291.5	236	65	20.6	37.3	14.3	69.3	193.8	194.8	.46
	100	234	236	57.5	16.3	37.2	11.4	70	193.7	194.2	.26
8" x 8" TRIPLEX PUMP and 20-H. P. Motor.	75	176	240	41.2	13.3	37.4	8.65	65	194.6	195.2	.31
	50	118.5	236	31.5	9.96	37.4	5.83	58.5	194.3	195.2	.47
	25	60.7	240	21.7	6.98	37.9	2.99	42.8	197.4	198	.30
	0	0	246	10.5	3.46	38.4					
			235	6	1.89						
								Motor Alone			
	150	351	228	76.4	23.3	36.1	16.7	71.8	188.1	188.5	.22
	125	291.5	236	65	20.6	37.3	14.3	69.3	193.8	194.8	.46
	100	234	236	57.5	16.3	37.2	11.4	70	193.7	194.2	.26
	75	176	240	41.2	13.3	37.4	8.65	65	194.6	195.2	.31
	50	118.5	236	31.5	9.96	37.4	5.83	58.5	194.3	195.2	.47
	25	60.7	240	21.7	6.98	37.9	2.99	42.8	197.4	198	.30
	0	0	246	10.5	3.46	38.4					
			235	6	1.89						
								Motor Alone			

\* Gland Packing allowed to become loose.

See note of explanation on opposite page.

## GOULDS TRIPLEX POWER PUMP FOR FIRE PROTECTION.

The Triplex Power Pump in operation will afford uniform delivery and absolutely even load upon motor or engine. These points specially adapt it for use with high speed electric motors, gas or oil engines. While largely employed in this manner as water supply pumps, the same considerations recommend them for fire pumps. Very strong claims can be made for the advantages a Triplex Power Pump operated by electric motor or gas engine possesses over an ordinary steam pump plant and in some instances over the Power Pump operated by steam engine. The motor or engine can be started immediately upon the alarm of fire and a fire stream delivered from Pump almost simultaneously. There can be no delay or loss in time consumed in getting up steam or making connections with Pump, and further, there is absolutely no expense involved except when engine and pump are in operation. This point will not need explanation or demonstration.

We give following table or recommendations of Triplex Power Pumps and Engine, with fire streams they would afford : —

**Fig. 924,** 5" x 8" Triplex Power Pump and 7½ h. p. Engine; Pump at 55 r. p. m. delivers 110 gallons or equivalent, one ¾" fire stream, 45 lbs. pressure.

**Fig. 924,** 6½" x 8" Triplex Power Pump and 10 h. p. Engine; Pump at 45 r. p. m., delivers 153 gallons or equivalent, one ⅞" fire stream, 50 lbs. pressure.

**Fig. 924,** 8" x 8" Triplex Power Pump and 15 h. p. Engine; Pump at 45 r. p. m., delivers 225 gallons or equivalent, one 1" fire stream 60 lbs. pressure.

**Fig. 924,** 9" x 10" Triplex Power Pump and 20 h. p. Engine; Pump at 40 r. p. m., delivers 332 gallons or equivalent, two ⅞" fire streams, 55 lbs. pressure.

**Fig. 924,** 8" x 10" Triplex Power Pump and 15 h. p. Engine; Pump at 40 r. p. m., delivers 260 gallons or equivalent, one 1 ⅛" fire stream, 50 lbs. pressure.

**Fig. 924,** 8" x 8" Triplex Power Pump and 15 h. p. Engine; Pump at 45 r. p. m., delivers 225 gallons or equivalent, two ¾" fire streams, 50 lbs. pressure.

**Fig. 924,** 8" x 10" Triplex Power Pump and 15 h. p. Engine; Pump at 40 r. p. m., delivers 260 gallons or equivalent, one ¾" fire stream and one ⅞" fire stream, 45 lbs. pressure.

We solicit correspondence on this head.

## GOULDS VERTICAL POWER FORCE PUMP.

WITH CRANK SHAFT, PULLEY AND HANDLE FOR HAND OR POWER.

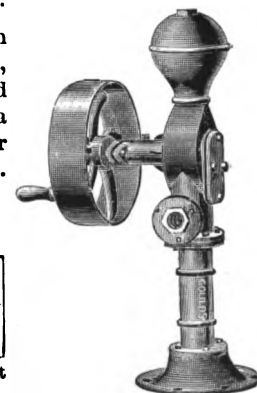
**Fig. 703** represents a new and admirable Vertical Power Force Pump for raising water from shallow wells or cisterns, by hand or power, and forcing it any distance required, or into boilers, tanks, etc. The Pump as we now build it possesses many advantages over the earlier types, and we believe its compact form and low price will commend it for the almost innumerable uses of a Pump of this kind. When so ordered we can furnish with cross head or guide (in place of plunger and lower valve) for connecting to plunger rod in cylinder below, thus adapting for deep wells. Cylinders like **Figs. 609** or **616** (pages 82 and 85) are then required, and cost extra.

**FIG. 703. SIZES, PRICES, ETC.**

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	Pulleys, Each.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	1 1/4 in. pipe.	1 1/4 in. pipe.	50 ft.	15 x 3 in.	Scotac	\$25.00
6	3 1/2 "	6 "	.25 "	1 1/4 "	1 1/4 "	50 "	15 x 3 "	Scour	30.00

\*Total lift and force from supply to point of delivery, Pump not more than 25 feet above water. Hot water must flow to pump.

See notes on Feed Water for Boilers, page 196.



**FIG. 703.**

## GOULDS VERTICAL POWER FORCE PUMP.

WITH CRANK SHAFT, TIGHT AND LOOSE PULLEYS FOR POWER.

**Fig. 881** represents our Vertical Power Force Pump with crank shaft (under crank case) and tight and loose pulleys, which will be found more convenient where machine power alone is used.

It would be difficult to enumerate the uses of this Pump, but might cite as a single one, suggestive of others, in creameries where a constant supply of flowing water is required.

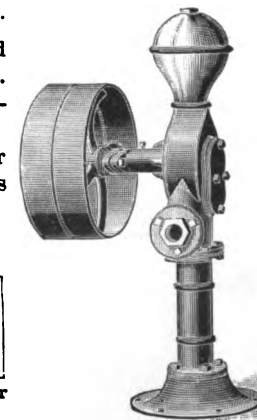
When so ordered, we can furnish with cross head or guide (in place of plunger and lower valve) for connecting to plunger rod in cylinder below, thus adapting for deep wells. Cylinders like **Figs. 609** or **616** (pages 82 and 85) are then required, and cost extra.

**FIG. 881. SIZES, PRICES, ETC.**

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	* Lift and Force.	Pulleys, Each.	Cipher.	Price.
4	3 in.	6 in.	.18 gal.	1 1/4 in. pipe.	1 1/4 in. pipe.	50 ft.	15 x 3 in.	Wardmo	\$30.00
6	3 1/2 "	6 "	.25 "	1 1/4 "	1 1/4 "	50 "	15 x 3 "	Wardrob	35.00

\*Total lift and force from supply to point of delivery, Pump not more than 25 feet above water. Hot water must flow to Pump.

See notes on Feed Water for Boilers, page 196.



**FIG. 881.**

## GOULDS HAND BOILER FEED PUMP.

ON PLANK. WITH BRASS GLOBE CHECK VALVE.

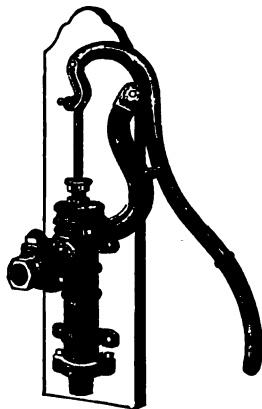


FIG. 289.

Fig. 289 represents a Hand Boiler Feed Pump on plank, for feeding cold boilers or those under moderate steam pressure, as 40 to 60 pounds per square inch. It is also well adapted for supplying feed water to boilers employed for making steam for heating only, etc.

The Pumps are supplied with brass globe check valve on discharge, preventing water from returning to Pump. They are also *metallic fitted throughout*, adapting them for pumping hot as well as cold water.

Where Pumps must handle hot water, we always advise placing them under flooded suction.

FIG. 289. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	*Lift and Force.	Equiv. Pressure.	Cipher.	Metallic Fitted.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 in. pipe.	120 ft.	51 lbs.	Digit	\$12.00
2	2½ "	6 "	.13 "	1½ "	1½ "	90 "	38 "	Dikes	14.00
4	3 "	6 "	.18 "	1½ "	1½ "	60 "	25 "	Dimal	16.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water. Hot water must flow to pump.

See notes on Feed Water for Boilers, page 196.

## GOULDS HAND BOILER FEED PUMP.

ON BASE. WITH BRASS GLOBE CHECK VALVE.

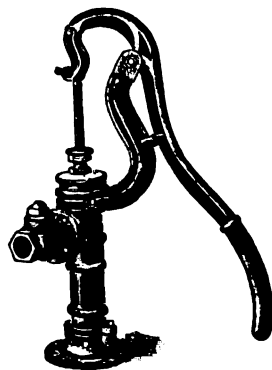


FIG. 495.

Fig. 495 is built on same lines as Fig. 289, illustrated and described above, except that it is a Base Pump and designed for the same range of duty. These Pumps are heavy and substantial in build, having revolving bearer, brass gland and brass cased piston rod, and must not be confused with cheaper Pumps of this class.

Always supplied with Brass Globe Check Valve and metallic fitted throughout.

FIG. 495. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	*Lift and Force.	Equiv. Pressure.	Cipher.	Metallic Fitted.
0	2 in.	6 in.	.08 gal.	1 in. pipe.	1 in. pipe.	120 ft.	51 lbs.	Headek	\$12.00
2	2½ "	6 "	.13 "	1½ "	1½ "	90 "	38 "	Healed	14.00
4	3 "	6 "	.18 "	1½ "	1½ "	60 "	25 "	Heaps	16.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water. Hot water must flow to Pump.

See notes on Feed Water for Boilers, page 196.

# GOULDS POWER BOILER FEED PUMP.

WITH COLUMN AND SINGLE PULLEY FOR MANUAL OR MACHINE POWER.

Fig. 482 represents our Power Boiler Feed Pump on bed plate, with column, crank shaft and face plate, with single pulley, for manual or machine power.

Pump has general application for feeding cold boilers or those under moderate steam pressure.

We always recommend shortest possible suction pipe with Boiler Feed Pump, as it lessens the danger of losing its priming.

FIG. 482. SIZES, PRICES, ETC.

No.	Dia. of Cyl.	Stroke.	Capacity per Min., 60 Strokes.	Suction.	Discharge.	* Lift and Force.	Equivalent Pressure.	Pulley.	Cipher.	Price.
0	2 in.	3 in.	2.45 gal.	1 in. pipe.	1 in. pipe.	120 ft.	60 lbs.	16 x 4 in.	Gull	\$30.00
2	2½ "	3 "	3.82 "	1½ "	1½ "	90 "	45 "	18 x 4 "	Gullyx	38.00
4	3 "	3 "	5.51 "	1½ "	1½ "	60 "	30 "	20 x 4 "	Gulps	48.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water. Hot water must flow to pump.

See notes on Feed Water for Boilers, page 196.



FIG. 482.

# GOULDS POWER BOILER FEED PUMP.

WITH COLUMN AND TWO PULLEYS, FOR MANUAL OR MACHINE POWER.

Fig. 484 represents improved pattern of Power Boiler Feed Pump with crank shaft, face plate, tight and loose pulleys, for manual or machine power. On the end of driving shaft opposite the face plate is a heavy iron crank with wrought-iron handle for working Pump when necessary.

Pumps may be employed for feeding steam boilers under moderate pressure, or any other service within limits cited in our table below.

FIG. 484. SIZES, PRICES, ETC.

No.	Dia. of Cyl.	Stroke.	Capacity per Min., 60 Strokes.	Suction.	Discharge.	* Lift and Force.	Equivalent Pressure.	Pulley.	Cipher.	Price.
0	2 in.	3½ in.	2.45 gal.	1 in. pipe.	1 in. pipe.	120 ft.	60 lbs.	16 x 4 in.	Hairs	\$34.00
2	2½ "	3½ "	3.82 "	1½ "	1½ "	90 "	45 "	16 x 4 "	Haily	40.00
4	3 "	3½ "	5.51 "	1½ "	1½ "	60 "	30 "	16 x 4 "	Half	50.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water. Hot water must flow to Pump.

See notes on Feed Water for Boilers, page 196.

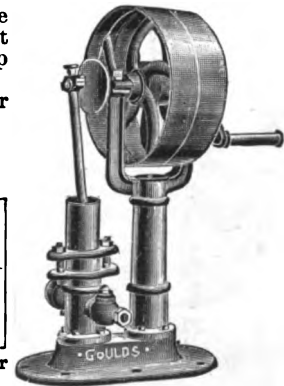


FIG. 484.

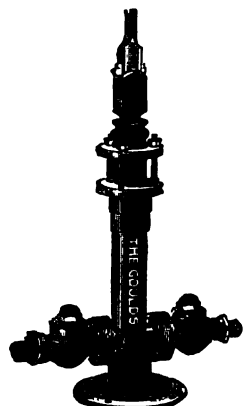


FIG. 292.

## GOULDS POWER BOILER FEED PUMP.

WITH STUB END FOR MACHINE POWER.

Fig. 292 represents our Power Boiler Feed Pump for supplying steam boilers with water against any pressure. The globe check valves are made of separate castings, faced off and bolted on the body of Pump by a tight-packed joint. The valve seats are made of best bronze and screwed into the iron castings, and can therefore be removed when worn out and other new ones inserted. The valve itself is also of bronze. The stuffing-box, top of piston and stub end are finished bright and polished.

FIG. 292. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Minute, 60 Strokes.	Suction.	Discharge.	* Lift and Force.	Equiv. Pressure.	Cipher.	Price.
00	1½ in.	9 in.	4.13 gal.	1 in. pipe.	1 in. pipe.	250 ft.	107 lbs.	Dimed	\$30.00
0	2 " "	9 " "	7.35 " "	1½ " "	1½ " "	250 " "	107 " "	Dimal	35.00
2	2½ " "	9 " "	11.47 " "	1½ " "	1½ " "	250 " "	107 " "	Dine	40.00
4	3 " "	9 " "	16.52 " "	1½ " "	1½ " "	250 " "	107 " "	Dingy	50.00

\* Total lift and force from supply to point of delivery, Pump not more than 25 feet above water. Hot water must flow to pump.

See notes on Feed Water for Boilers, page 196.

## GOULDS POWER BOILER FEED PUMP.

WITH STUB END FOR MACHINE POWER.

Fig. 485 represents Power Boiler Feed Pump with trunk plunger, which we offer in several sizes given below. Suction and discharge check valves are in one piece with cylinder casting, obviating possibility of leaky joints. This cheap yet serviceable Pump has general application for feeding steam boilers under moderate pressure, or for any limit duty indicated in our tables.

FIG. 485. SIZES, PRICES, ETC.

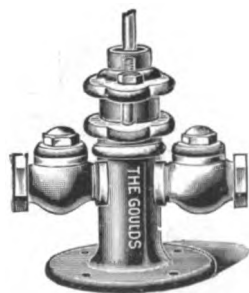


FIG. 485.

No.	Dia. Cyl.	Stroke.	Capacity per Minute, 60 Strokes.	Suction.	Discharge.	* Lift and Force.	Equiv. Pressure.	Cipher.	Price.
2	1¼ in.	6 in.	1.27 gal.	¼ in. pipe.	¼ in. pipe.	150 ft.	64 lbs.	Halls	\$10.00
3	1½ " "	6 " "	1.84 " "	1 " "	1 " "	150 " "	64 " "	Halor	15.00
4	1½ " "	3 " "	1.37 " "	¾ " "	¾ " "	150 " "	64 " "	Halt	14.00
5	2 " "	3 " "	2.45 " "	1 " "	1 " "	120 " "	51 " "	Hames	18.00
6	2½ " "	3 " "	3.82 " "	1 " "	1 " "	90 " "	38 " "	Hands	22.00
7	3 " "	3 " "	5.50 " "	1½ " "	1½ " "	60 " "	25 " "	Fank	27.00
8	2 " "	6 " "	3.26 " "	1½ " "	1½ " "	120 " "	51 " "	Hard	22.00
9	2½ " "	6 " "	5.10 " "	1½ " "	1½ " "	90 " "	38 " "	Hares	30.00
10	3 " "	6 " "	7.35 " "	1½ " "	1½ " "	120 " "	51 " "	Harks	40.00

\* Total lift and force from supply to point of delivery, Pump not more than 20 feet above water. Hot water must flow to Pump.

See notes on Feed Water for Boilers, page 196.



## “ROYAL” STEAM BOILER FEED PUMP.

The “Royal” is a new and improved Steam Boiler Feed Pump, and has many points of merit in its arrangement, construction and proportions not found in any other pumps.

The main or frame casting, with supporting arm, is all in one piece, so that the shaft revolves in perfectly rigid bearings, while the eccentric connection works in a vertical line, without any lateral pressure on the valve rod to heave and pull the steam chest, cramp the rod and create friction. The cylinder heads have ground surfaces; the space between cylinder and chest is tapped on either side for the exhaust steam pipe, and the brass globe check valves are each designated “suction” or “discharge” for convenience, and can be connected on either side of Pump if necessary. If water is to be raised by suction, put a foot valve and strainer on end of suction pipe and make all joints tight.

Engineers all say that the GOULD “ROYAL” is the most substantial, best proportioned and modern in its general construction and arrangement of parts, of any of the large number of Single-Acting Boiler Feed Pumps, and always give it the preference over all others.

With each Pump we furnish Throttle Valve, Oil Cup and Let-Off Plugs.

The table below will give a full description of capacity, prices, etc., of these Pumps.

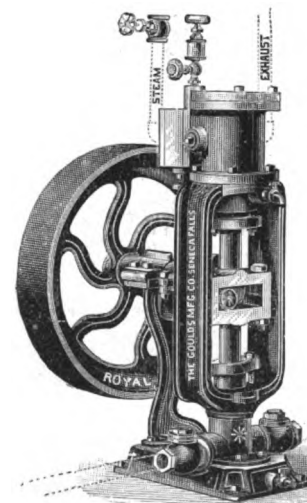


FIG. 687.

FIG. 687. SIZES, PRICES, ETC.

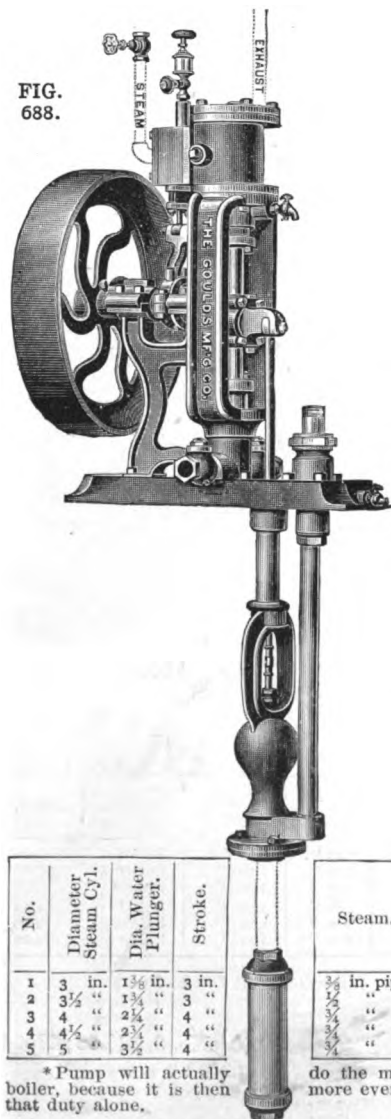
No.	Dia. Steam Cyl.	Dia. Water Plunger.	Stroke.	Steam.	Exhaust.	Suction and Discharge.	Rev. per Min.	Capacity per Min.	* Lift and Force.	Equiv. Pressure.	Cipher.	Price.
1	3 in.	1 3/4 in.	3 in.	3/4 in. pipe.	3/4 in. pipe.	1 in. pipe.	100	1.93 gal.	200 ft.	100 lbs.	Sagot	\$44.00
2	3 1/2 "	1 3/4 "	3 "	3/4 "	3/4 "	1 "	100	3.12 "	200 "	100 "	Sailor	55.00
3	4 "	2 1/4 "	4 "	3/4 "	1 "	1 1/4 "	90	6.20 "	200 "	100 "	Sakels	70.00
4	4 1/2 "	2 3/4 "	4 "	3/4 "	1 "	1 1/2 "	85	8.75 "	200 "	100 "	Salad	82.50
5	5 "	3 1/2 "	4 "	3/4 "	1 1/4 "	1 1/2 "	80	13.33 "	200 "	100 "	Saleso	110.00
6	6 "	4 "	5 "	1 "	1 1/2 "	2 "	75	21.75 "	200 "	100 "	Salty	154.00

\*Total lift and force from supply to point of delivery, Pump not more than 25 feet above water. Hot water must flow to Pump.

See notes on Feed Water for Boilers, page 196.

Pumps with brass-lined cylinder and brass-cased plunger add to list No. 1, \$8.00; No. 2, \$10.00; No. 3, \$12.50; No. 4, \$16.00; No. 5, \$21.00; No. 6, \$30.00.

FIG.  
688.



## GOULDS "ROYAL" STEAM BOILER FEED PUMP.

WITH EXTENSION FOR WELLS.

This cut shows our "Royal" Steam Boiler Feed Pump, with extension or set length below the bed plate, so that it can be operated in wells, pumping cold water into a tank and forcing into the boiler at the same time. For a full description of the "Royal" Steam Boiler Feed Pumps, see our Fig. 687, on preceding page. The combination as shown in this cut will be greatly appreciated by those who have to obtain their water from wells. The sizes and prices we give below. The prices include everything shown in the cut, except the gas pipe and rods between the air chamber and lower cylinder; these we furnish according to the depth of the well.

With each Pump we furnish Throttle Valve, Oil Cup and Let-Off Plugs.

FIG. 688. SIZES, PRICES, ETC.

No.	Diameter Steam Cyl.	Dia. Water Plunger.	Stroke.
1	3 in.	1 3/8 in.	3 in.
2	3 1/2 "	1 3/4 "	3 "
3	4 "	2 "	4 "
4	4 1/2 "	2 3/4 "	4 "
5	5 "	3 1/2 "	4 "

Steam.	Exhaust.	Suction and Discharge.	Diameter Lower Cyl.	Revolutions per Minute.	Capacity per Minute.	* Lift and Force.	Working Pressure.	Cipher.	Price.
1 1/2 in. pipe.	3/4 in. pipe.	1 in. pipe.	1 1/2 in.	50	.96 gal.	100 to 200 ft.	100 lbs.	Hear	\$62.00
2 "	1 "	1 1/4 "	2 "	50	1.56 "	100 to 200 "	100 "	Heated	73.00
3 "	1 1/4 "	1 1/2 "	2 1/2 "	45	3.10 "	100 to 200 "	100 "	Heel	90.00
4 "	1 1/2 "	1 3/4 "	3 "	40	4.11 "	100 to 200 "	100 "	Hefty	133.00
5 "	1 3/4 "	1 1/2 "	3 1/2 "	40	6.66 "	100 to 200 "	100 "	Heir	130.00

\* Pump will actually boiler, because it is then that duty alone.

do the most and best work when employed for double duty of pumping from well to tank and tank to more evenly balanced. We do not recommend for pumping from very deep wells when employed for

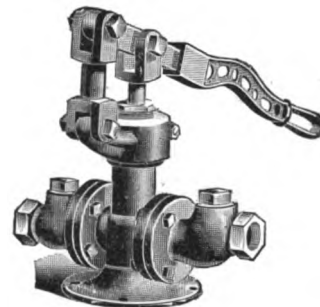
See notes on Feed Water for Boilers, page 196.

# GOULDS HYDRAULIC PRESSURE OR TEST PUMP.

FOR TESTING BOILERS, PIPES, ETC.

**Fig. 867** represents a new Hydraulic Pressure or Test Pump, of compact build and of commensurate strength for work for which it is designed.

It has a revolving top, admitting its being worked in any position, and a sectional lever which can be changed to give greatest leverage. The suction and discharge valves (flanged and bolted to cylinder) are of a new and improved type, with brass valve seats, poppets and caps. The Pump should be placed within short suction distance of water, or on a level with it, and will be found invaluable to the boiler-maker or user for testing the condition of Boilers, Vessels, etc., for cleaning out pipes, etc.



**FIG. 867. SIZES, PRICES, ETC.**

**FIG. 867.**

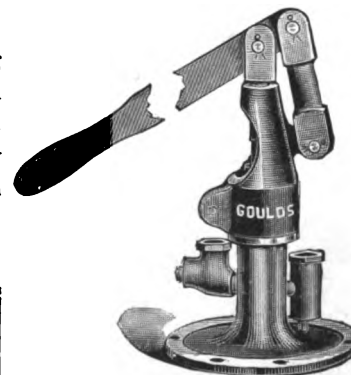
No.	Dia. Ram.	Stroke.	Suc. and Dis.	Working Pressure.	Cipher.	Price.
0	$\frac{3}{4}$ in.	5 in.	1 in. pipe.	700 lbs.	Webbed	\$20.00
1	1 "	5 "	1 "	550 "	Webbery	21.50
2	$1\frac{1}{4}$ "	5 "	1 "	400 "	Webby	22.50
3	$1\frac{1}{2}$ "	5 "	1 "	200 "	Wedah	27.50

Can furnish with strong wood barrow with cast-iron tank underneath, at \$10.00 extra list.

# GOULDS HIGH SERVICE PRESSURE OR TEST PUMP.

FOR TESTING BOILERS, TANKS, ETC.

**Fig. 941** is designed to supply the demand for a Test Pump capable of generating any desired pressure up to 6,000 pounds per square inch. The body or cylinder, as well as ram, is of steel, the valves of best gun metal and the lever forged from wrought-iron. In short, we have sacrificed nothing that would contribute to the strength and efficiency of this Pump, and the results have vindicated our policy. Our table of dimensions given below further illustrates the compactness and power of our Pump.



**FIG. 941. SIZE, PRICE, ETC.**

**FIG. 941.**

Dia. Ram.	Stroke.	Suc. and Dis.	Working Pressure.	Cipher.	Price.
$\frac{1}{2}$ in.	2 in.	$\frac{3}{4}$ in. pipe.	6000 lbs.	Wetish	\$30.00

# GOULDS HYDRAULIC TEST PUMP.

WITH CAST-IRON TANK.



FIG. 789.

Fig. 789 illustrates our new Gun Metal Test Pump, for testing boilers, tanks, pipes, etc., to one thousand pounds pressure on the square inch, if necessary. As the cistern only holds about two gallons of water, the thing to be tested should first be filled by other means and the tester then applied to supply the balance and work up the pressure.

Everything is made first-class in all respects. Weight about forty pounds.

## FIG. 789. SIZE, PRICE, ETC.

Complete as shown, with  $\frac{7}{8}$  inch piston and delivery pipe screwed for  $\frac{1}{2}$  inch gas pipe coupling \$ (Wedder) \$30.00

This price does not include Test Gauge, which will be supplied of any desired size or style at lowest market rates.

# PLUMBERS' BRASS FORCE PUMPS.

In Fig. 1035 we show our new Plumbers' Brass Force Pump which, we believe, will meet the requirements and approval of the Trade. For removing obstructions in waste or water pipes, Pump is placed in vessel of water and pipe to be cleared connected to Pump by hose. For this purpose we furnish three feet of hose and conical tip, that may readily be connected to any ordinary sized pipe. Pump is very compact and may easily be carried in sack of plumbers' tools, etc.

## FIG. 1035. SIZE, PRICE, ETC.

1 inch Diameter Cylinder, 16 inch Stroke . . . . (Baldwin) \$7.00

# PLUMBERS' BRASS FORCE PUMP.

Fig. 322 represents our Plumbers' Force Pump for removing obstructions in waste and water pipes. All working parts are brass. Discharge is furnished with brass check valve and fitted with hose coupling. In operating this Pump, a hose is connected to pipes to be cleared and Pump set in vessel of water.

## FIG. 322. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Discharge.	Cipher.	Price.
o	2 in.	5 in.	.07 gal.	$\frac{3}{4}$ in. hose.	Dusty	\$14.00

FIG. 322.

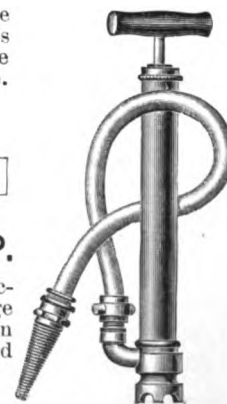


FIG. 1035.

## GOULDS BRASS ALE AND BEER PUMP.

Fig. 320, shown in cut, is an Ale and Beer Pump. It has brass cylinder, brass plunger and rod, and brass valves. Pump is usually furnished with standard for screwing to floor, but we furnish it with or without this standard, as ordered. Suction and discharge fitted for lead pipe. It is a handsomely finished pump.

FIG. 320. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	Cipher.	Price.
2	2½ in.	8 in.	.17 gal.	½ in. lead pipe.	½ in. lead pipe.	Duskyl	\$7.00

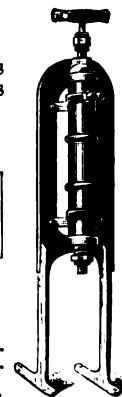


FIG. 320.

## GAS COMPANIES' AND PLUMBERS' DRIP PUMP.

Fig. 323, illustrated in cut, is our Plumbers' and Gas Companies' Drip Pump for extracting the water from gas drips. These Pumps have brass cylinders, brass valves and plunger rod, glands, etc. Suction is regularly fitted for wrought-iron pipe, unless otherwise ordered.

FIG. 323. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Cipher.	Price.
0	2 in.	9 in.	.12 gal.	¾ in. pipe.	Dutch Chesteg	\$12.00
2	2½ in.	9 in.	.19 "	¾ in. pipe.		16.00

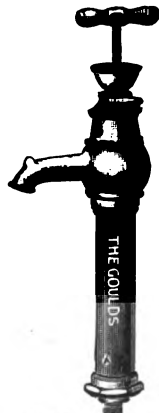


FIG. 323.

## GOULDS "MAGIC" HAM CURING PUMP.

ALL WORKING PARTS BRASS.

Fig. 922 represents our "Magic" Ham Curing Pump. All working parts are brass, including double crimped packed plunger, brass valves and seats. We furnish with this Pump 3 feet of ½-in. rubber suction and discharge hose and nickel plated needle point. This is a well proportioned Pump with a powerful leverage. The office of the Pump is to thoroughly impregnate the ham with a suitable preparation or pickle, thus curing it quicker and better in any season than by the old process. We can furnish interested parties recipes for pickle.

FIG. 922. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Suction.	Discharge.	Cipher.	Price.
0	2 in.	5 in.	½ in. hose.	½ in. hose.	Wevill	\$15.00

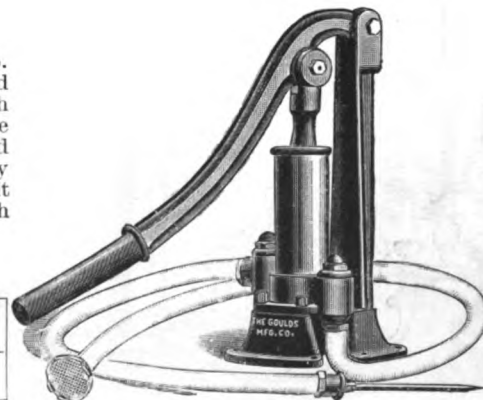


FIG. 922.

## GOULDS POWER GAS OR AIR PUMP.

FOR GAS OR OIL WELLS, WHITE LEAD WORKS, ETC.

These Pumps are used very extensively in the oil wells of America, for exhausting the gas from them, and thereby largely increasing their production, as well as for increasing flow of gas from natural gas wells which might otherwise be abandoned or unproductive. They can also be used for compressing or exhausting air or gas in large volumes.

Pump is furnished with coupling for wood rod of wind mill, walking beam, etc.

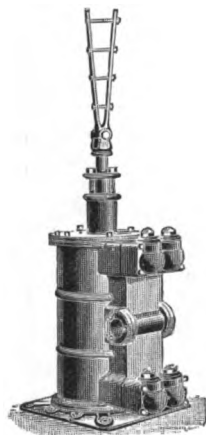


FIG. 280.

FIG. 280. SIZE, PRICE, ETC.

Dia. Cyl.	Stroke.	Displacement free air per Stroke.	Suction.	Discharge.	Cipher.	Price.
14 in.	20 in.	3076 cu. in.	2 in. pipe.	2 in. pipe.	Dance	\$125.00

## GOULDS GAS FITTERS' PROVING PUMP.

WITH MERCURY GAUGE.

Fig. 1065 shows our Gas Fitters' Proving Pump with Mercury Gauge. It affords the best known means of testing pipes. We price below, Pump complete, also separate parts if wanted.

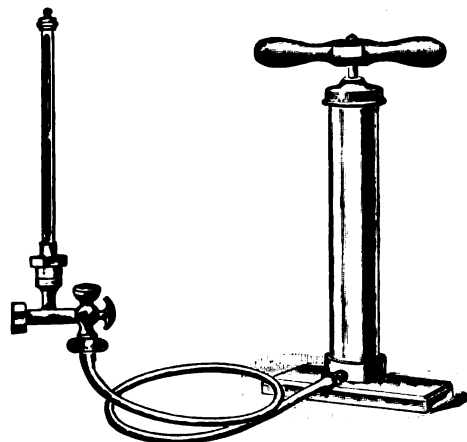


FIG. 1065.

FIG. 1065. SIZE, PRICE, ETC.

No.	Diameter Cylinder.	Stroke.	Displacement per Stroke.	Discharge.	Cipher.	Price.
0	2 in.	10 in.	31 cu. in.	3/8 in. hose.	Dabcer	\$12.00

Proving Pump, complete with Mercury Gauge and Hose . . . . . \$25.00  
 Mercury Gauge complete, including Cock and Ether Cup . . . . . 10.00

## GOULDS BRASS AIR PUMP.

MOUNTED ON PLANK. WITH WROUGHT-IRON LEVER.

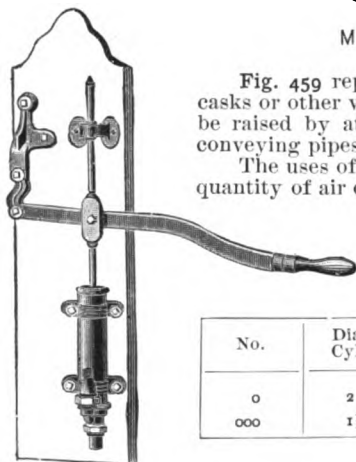


FIG. 459.

Fig. 459 represents a Brass Air Pump of proper construction for forcing air or gas into barrels, casks or other vessels. In this manner the most destructive acids, such as nitric, sulphuric, etc., may be raised by atmospheric pressure without coming in contact with Pump, or in fact anything except conveying pipes.

The uses of an Air Pump are so various, that we prefer to know for what it is to be employed, quantity of air desired, etc.

FIG. 459. SIZES, PRICES, ETC.

No.	Diameter Cylinder.	Stroke.	Displacement per Stroke.	Discharge.	Limit Pressure.	Cipher.	Price.
0	2 in.	6 in.	22 cubic in.	$\frac{3}{4}$ in. pipe.	100 lbs.	Girl	\$15.00
000	1½ "	10 "	17 " "	$\frac{1}{4}$ "	200 "	Girdic	30.00

## GOULDS BRASS AIR PUMP.

MOUNTED ON PLANK. WITH CRANK SHAFT AND FLY-WHEEL.

Fig. 893 is substantially the same as Fig. 459, described above, and adapted for the same purposes. Where any amount of pressure is required it will be generated much easier with the aid of Crank Shaft or Fly-Wheel than with lever.

We might also say this style of Pump is extensively used for pumping air into beer casks and raising it without aid of other appliances.

FIG. 893. SIZES, PRICES, ETC.

No.	Diameter Cylinder.	Stroke.	Displacement per Stroke.	Discharge.	Limit Pressure.	Cipher.	Price.
0	2 in.	6 in.	22 cubic in.	$\frac{3}{4}$ in. pipe.	100 lbs.	Wampum	\$28.00
000	1½ "	10 "	17 " "	$\frac{1}{4}$ "	200 "	Wanba	43.00

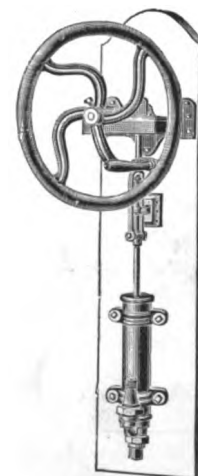


FIG. 893.

# GOULDS AIR COMPRESSOR OR VACUUM PUMP.

WITH PITMAN FOR POWER.

**Fig. 605** represents our Air Compressor or Vacuum Pump, arranged with stub end for power connection. It is constructed with brass-lined cylinder and metallic valves in a scientific manner, so that all the air received into the cylinder on the up-stroke of the piston will be forced out on the down-stroke. This Pump has a general application for filling receivers, revivifying gas, etc.

The size of receiver that it will fill will be governed by the pressure; that is, at 50 revolutions, the No. 16 Pump will deliver 15,950 cubic inches or about 9 cubic feet at ordinary atmospheric pressure.

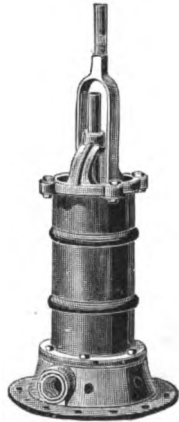


FIG. 605.

At 2 atmospheres, or 15 lbs. pressure, about 4½ cubic feet.
" 3 " " 30 " " 3 " "
" 4 " " 45 " " 2½ " "

FIG. 605. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Displacement Free Air per Stroke.	Inlet.	Outlet.	Working Pressure.	Cipher.	Price.
16 24	6 in. 8 "	12 in. 12 "	339 cu. in. 600 "	1½ in. pipe. 1½ "	1½ in. pipe. 1½ "	75 lbs. 75 "	Moore Clubo	\$40.00 50.00

# GOULDS AIR COMPRESSOR OR VACUUM PUMP.

WITH BRAKE FOR HAND POWER.

**Fig. 772** represents our Air Compressor or Vacuum Pump arranged with brake for hand power, where no other is available. Excepting only the difference in construction of pitman, guide, etc., it is in all other respects the same as our **Fig. 605**, given above, having the same applications, and would refer to that Pump for full description, etc.

FIG. 772. SIZES, PRICES, ETC.

No.	Dia. Cyl.	Stroke.	Displacement Free Air per Stroke.	Inlet.	Outlet.	Working Pressure.	Cipher.	Price.
16 24	6 in. 8 "	12 in. 12 "	339 cu. in. 600 "	1½ in. pipe. 1½ "	1½ in. pipe. 1½ "	50 lbs. 50 "	Viary Dashed	\$50.00 60.00

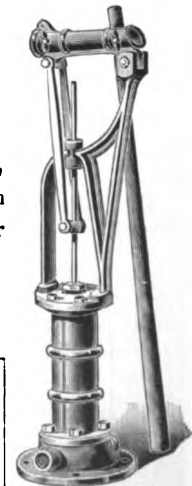


FIG. 772.



# GOULDS POWER AIR PRESSURE OR VACUUM PUMP.

WITH CRANK SHAFT AND PULLEYS.

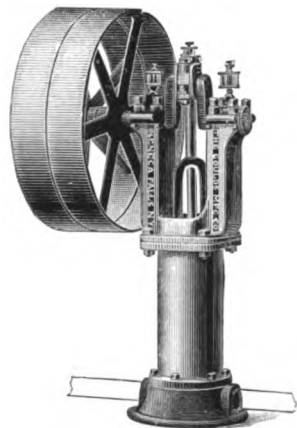


FIG. 1029.

Fig. 1029 represents our Air Pressure or Vacuum Pump, with crank shaft, pitman and guide, arranged with tight and loose pulleys for power. Pump has brass-lined cylinder with metallic valves. Air is received into cylinder through inlet opening in base on the up stroke of piston, and forced out through discharge opening in base on the downward stroke of piston.

These pumps have a general application of forcing air into receivers, to agitate liquids, and are also used in connection with the dry-pipe sprinkler system in mills and factories. It may also be used for any purpose where a vacuum is required.

FIG. 1029. SIZE, PRICE, ETC.

PLUNGERS.		Displacement Free Air per Rev. of Crank Shaft.	Maximum Speed.	Maximum Pressure.	Inlet and Outlet.	Cipher.	Price.
Dia.	Stroke.						
6 in.	8 in.	226 cubic in.	60 rev.	30 lbs.	1 1/4 in. pipe.	Banjo	\$80.00

## GOULDS DUPLEX AIR PRESSURE PUMP.

Fig. 1008, Duplex Air Compressor, is designed to operate against pressures up to about 40 pounds per square inch, for continuous running at 100 revolutions per minute. For brief periods it will compress to 100 pounds. The in-take is through the plungers, consequently it can be used only as an air compressor. The cylinders should be kept cool by flowing water around them. It is of neat design, compact, and self-contained, well built, and has proved to be a very satisfactory compressor.

FIG. 1008. SIZE, CAPACITY, ETC.

PLUNGERS.		Displacement Free Air one Rev. of Crank Shaft.	Speed and Displacement per Min., varying with the Kind of Work.	Discharge.	Tight and Loose Pulleys.	Cipher.	Price.
Dia.	Stroke.						
2 1/2 in.	5 in.	49 cubic in.	50 to 100 revs. — 10 to 20 gals.	1 in. pipe.	15 x 3 in.	Boxwood	\$120.00

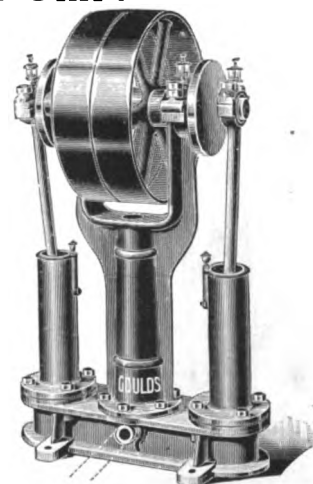


FIG. 1008.

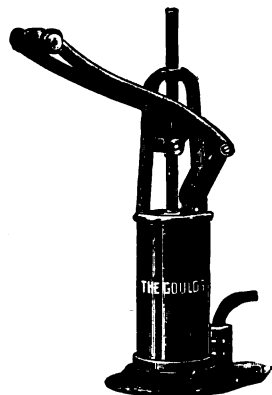


FIG. 928.

## "LIGHTNING" AIR PRESSURE PUMP.

FOR HAND USE.

Fig. 928, "Lightning" Air Pressure Pump, has working parts of brass with strong bearer top guiding rod worked by compound lever. This Pump has a general application for filling receivers, pneumatic tires on road carts, bicycles, etc., also for testing soil pipe.

The following table will give a fair idea of the capacity of this Pump.

75 feet of 4 inch pipe can be filled to	5 lbs. per square inch in	1½ minutes.
" " " " " "	10 " " "	3 " "
" " " " " "	15 " " "	4½ " "
" " " " " "	20 " " "	7 " "
" " " " " "	25 " " "	10 " "

FIG. 928. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Displacement per Stroke.	Discharge.	Working Pressure.	Cipher.	Price.
4	3 in.	4 in.	28 cu. inches	¾ inch hose.	50 lbs.	Welsh	\$10.00

3¼ inch Brass Case Pressure Gauge and Cock  
¾ inch C. I. Rubber Tubing, per foot .

\$3.50  
.10

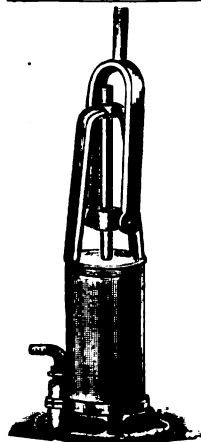


FIG. 1066.

## GOULDS "LIGHTNING" AIR PRESSURE PUMP.

WITH PITMAN FOR POWER.

Fig. 1066, "Lightning" Air Pressure Pump, is practically the same as Fig. 928, described above, except arranged with pitman and stub end for power. This little Pump has many applications, such as filling reservoirs, pumping air in revivifying gas, etc.

FIG. 1066. SIZE, PRICE, ETC.

No.	Dia. Cyl.	Stroke.	Displacement per Stroke.	Discharge.	Working Pressure.	Cipher.	Price.
4	3 in.	4 in.	28 cu. in.	¾ in. hose.	50 lbs.	Collog	\$10.00

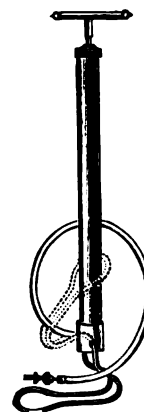
## GOULDS NICKEL-PLATED AIR PRESSURE PUMP.

FOR FILLING PNEUMATIC TIRES.

**Fig. 1063, "Bicycle Pump,"** commonly called, has all working parts brass nickel-plated. The foot-rest when not in service can be brought into position shown by dotted lines in engraving, making Pump very compact and convenient for carrying. With these Pumps, we furnish two feet rubber discharge hose with universal couplings. When advised of make of tire we furnish a nipple to complete connection to air valve.

**FIG. 1063. SIZE, PRICE, ETC.**

Dia. Cyl.	Stroke.	Displacement per Stroke.	Discharge.	Cipher.	Price.
1½ in.	11 in.	16 cu. in.	3-16 in. hose.	Aspara	\$2.00



**FIG. 1063.**

## GOULDS NICKEL-PLATED AIR PRESSURE PUMP.

FOR FILLING PNEUMATIC TIRES.

In our new "Bicycle Pump" all working parts are brass, nickel-plated, except plunger rod, which is steel. A malleable iron foot-rest, with four screw-holes, adapts Pump for either stationary or portable use.

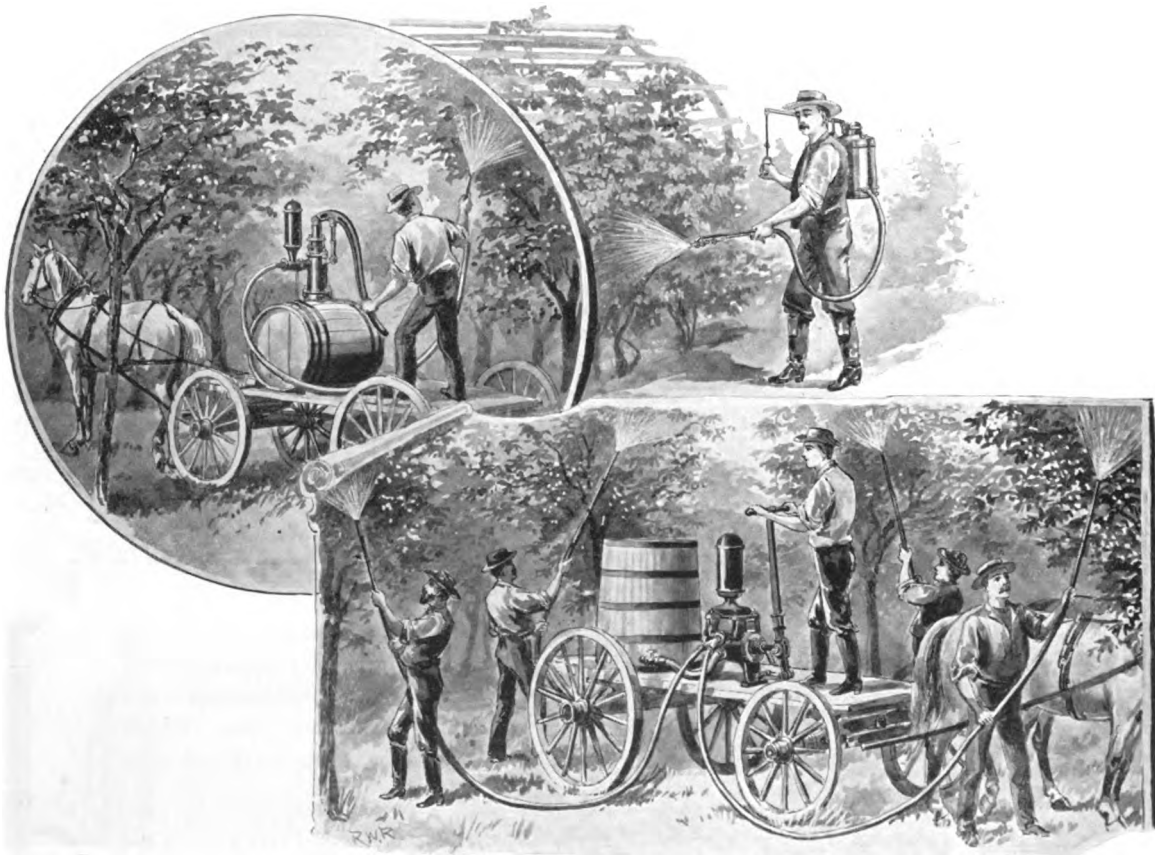
With each Pump we furnish two feet rubber discharge hose with a genuine universal coupling—not a clap-trap clamp—and when advised of make of tire, a nipple to complete connection to air valve. Wheelmen generally recognize the need of a Pump built for service and are quick to appreciate merit and value in a good Pump as in other bicycle accessories.

**FIG. 1037. SIZE, PRICE, ETC.**

Dia. Cyl.	Stroke.	Displacement per Stroke.	Discharge.	Cipher.	Price.
1½ in.	11 in.	16 cu. in.	3-16 in. hose.	Acology	\$2.50



**FIG. 1037.**



How and when to spray—that is the question. The time is past when intelligent people ponder and discuss the advisability of spraying. They are learning that their fruit may be saved by spraying at an expense which is relatively trifling. No successful orchardist or progressive farmer needs to-day to be told that in order

to obtain sound fruit, or indeed in many cases, any fruit at all, he must adopt the best available means of destroying both fungous and insect pests. Spraying being the only practical known way of saving trees, shrubs and all plants from their numerous enemies, he wisely concludes: Let us spray. See pages 251 to 263 for Spray Pumps and Nozzles.

The next questions are: What are the best methods of spraying, and who manufactures the best Spray Pumps and Nozzles?

To assist the public in arriving at a speedy and satisfactory solution of the problem, we offer in the following pages a few general remarks concerning the fungous diseases and fungicides, insects and insecticides, and complete description of the best spraying outfits in the market, together with a "Spraying Calendar," describing the best remedies and the methods of preparing and applying them.

In our illustration we can only suggest the best methods and means of spraying vines, bushes, trees, etc.

In upper right-hand corner, we show in operation (**Fig. 989**) Knapsack Pump, spraying grape vines. This Knapsack Spray Pump will be found page 258.

In upper left-hand corner (**Fig. 905½**), Double-Acting Spray Pump, shown with single lead of hose for spraying trees. Pump can be fitted with double leads of hose, or with return to barrel for agitating liquid. See page 253 for further description.

At bottom we show (**Fig. 963**) Double-Acting Spray Pump, with four leads of hose for spraying large orchards, etc. See page 257.

Thus shall we hope to have contributed our mite toward the welfare of those whose pleasant and enviable occupation it is to furnish us with fresh fruit and fragrant flowers.

This class of Spray Pumps and Nozzles is given between pages 252 and 263.

# GOULDS "STANDARD" DOUBLE-ACTING SPRAY PUMP.

WITH BRASS-LINED CYLINDER AND BRASS-CASED DIFFERENTIAL PLUNGER WITH BRASS VALVE SEAT.

**Fig. 905** is a strong Double-Acting Spray Pump, with brass-lined cylinder and brass-cased differential plunger with brass valve seat, specially adapting it for diffusing poisonous mixtures such as Bordeaux, Paris Green, Copper Sulphate Kerosene Emulsions, etc., upon the trees, vines and bushes. The differential plunger forms the air chamber and contributes to sustaining a continuous and uniform discharge at spray nozzles. The base is adapted for either end or side of barrel, Lever is extra long and strong. Pump has double discharges cut for pipe, but when ordered without hose or spray nozzles, we plug one opening and fit the other with brass bushing and half coupling for hose. Also, supply brass suction strainer. Prices do not include barrel.

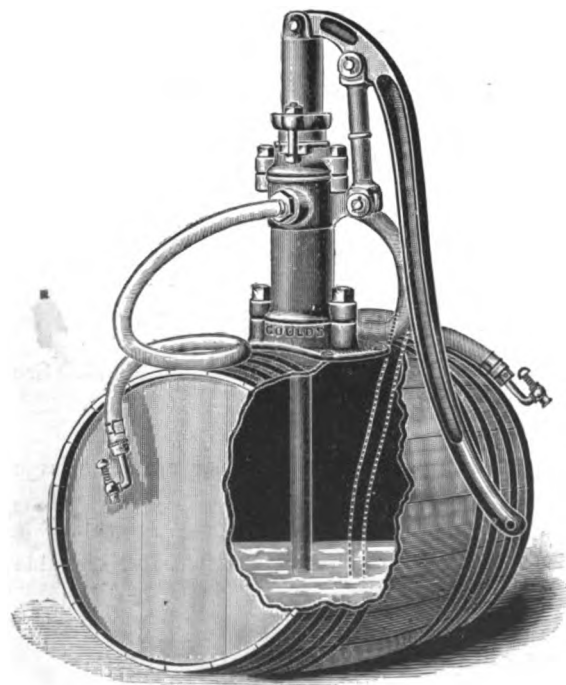


FIG. 905.

FIG. 905. SIZES, PRICES, ETC.

	Dia. Outer Cyl.	Suction.	Double Dis.	Cipher.	Brass Lined.
Pump Only . . .	2½ in. 3 "	1 in. pipe. 1½ "	½ in. hose and ¾ in. pipe. ¾ in. hose and 1 in. pipe.	Waspfly Waract	\$8.50 9.50
OUTFIT A, FOR Single Spray.	Fig. 905. 2½-In. Spray Pump with 2½ ft. 1-in. iron suction pipe with brass strainer and one lead of 10 ft., ½-in. discharge hose, with "Seneca" (or other) spray nozzle. (Wryneck)				\$12.50
OUTFIT AA.	Fig. 905. 3-in. Spray Pump fitted in same manner . . . . . (Warads)				\$13.50
OUTFIT B, FOR Double Spray, as shown in cut.	Fig. 905. 2½-In. Spray Pump with 2½ ft. 1-in. iron suction pipe with brass strainer and two leads of 10 ft. each, ½-in. discharge hose with "Seneca" (or other) spray nozzles. (Wrythen)				\$15.50
OUTFIT BB.	Fig. 905. 3-in. Spray Pump fitted in same manner . . . . . (Warads)				\$16.50
OUTFIT C, Single Spray and Agitator.	Fig. 905. 2½-In. Spray Pump with 2½ ft. 1-in. iron suction pipe with brass strainer, one lead 10 ft., ½-in. discharge hose, with "Seneca" (or other) spray nozzle, and 4 ft. iron pipe or hose for Agitator returning to barrel. (Wullin)				\$14.00
OUTFIT CC.	Fig. 905. 3-in. Spray Pump fitted in same manner . . . . . (Warads)				\$15.00

Pump fitted with metallic lower valve . . . . . \$1.00 extra, net.  
With suction arranged for hose . . . . . .50 " "

See pages 260 to 263 for Spray Nozzles, and pages 314 to 318 for Hose, Couplings, etc.

"Spraying Catalogue and Calendar," furnished upon application.

# GOULDS "STANDARD" DOUBLE-ACTING SPRAY PUMP.

WITH BRASS-LINED CYLINDER, BRASS-CASED DIFFERENTIAL PLUNGER WITH BRASS VALVE SEAT.

**Fig. 905½** shows our Double-Acting Spray Pump with base for attaching to either side or top of barrel. This pump has brass-lined cylinder, brass-cased differential plunger, and is substantially the same as **Fig. 905** described on foregoing page, but has an additional air chamber on spout. In spraying old orchards this is a considerable advantage, as the spray can be discharged to topmost branches. Pump has double discharges cut for pipe, but when ordered without hose and nozzles, we plug one opening and fit the other with brass bushing and half coupling for hose. Also supply brass suction strainer. Prices do not include barrel.

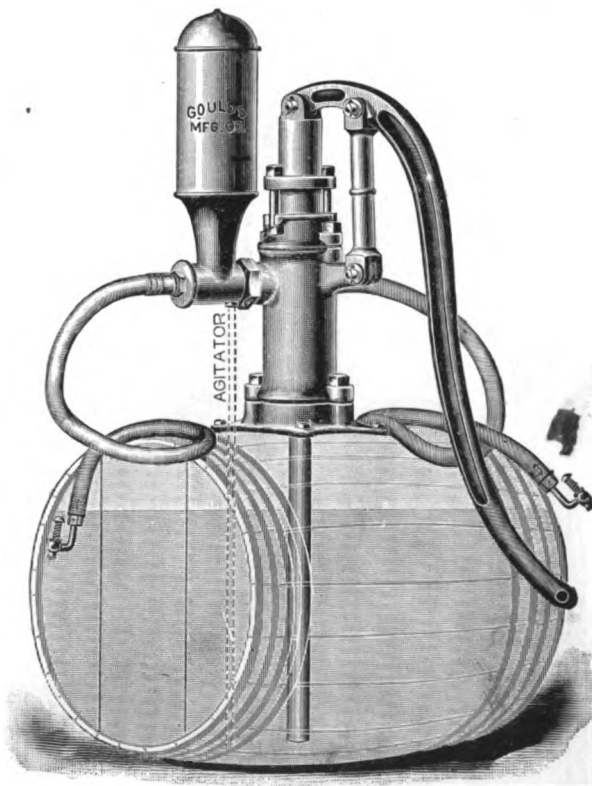
**FIG. 905½. SIZES, PRICES, ETC.**

	Dia. Outer Cyl.	Suction.	Double Dis.	Cipher.	Brass Lined.
<b>Pump Only.</b>	2½ in. 3 in.	1 in. pipe. 1½ in.	½ in. hose and ¾ in. pipe. ¾ in. hose and 1 in. pipe.	Zuta Zymfk	\$9.50 10.50
<b>OUTFIT A, FOR Single Spray.</b>	<b>Fig. 905½.</b> 2½ in. Spray Pump with 2½ ft. 1-in. iron suction pipe with brass strainer and one lead of 10 ft., ½ in. discharge hose, with "Seneca" (or other) spray nozzle. (Zutex)				\$13.50
<b>OUTFIT AA.</b>	<b>Fig. 905½.</b> 3-in. Spray Pump fitted in same manner (Zymfks)				\$14.50
<b>OUTFIT B, FOR Double Spray, as shown in cut.</b>	<b>Fig. 905½.</b> 2½ in. Spray Pump with 2½ ft. 1-in. iron suction pipe with brass strainer and two leads of 10 ft. each, ½ in. discharge hose, with "Seneca" (or other) spray nozzles (Zuto)				\$16.50
<b>OUTFIT BB.</b>	<b>Fig. 905½.</b> 3-in. Spray Pump fitted in same manner (Zymfma)				\$17.50
<b>OUTFIT C, Single Spray and Agitator.</b>	<b>Fig. 905½.</b> 2½ in. Spray Pump with 2½ ft. 1-in. iron suction pipe with brass strainer, one lead 10 ft., ½ in. discharge hose, with "Seneca" (or other) spray nozzle, and 4 ft. iron pipe or hose for Agitator returning to barrel (Zutal)				\$15.00
<b>OUTFIT CC.</b>	<b>Fig. 905½.</b> 3-in. Spray Pump fitted in same manner (Zymfnd)				\$16.00

Pump fitted with metallic lower valve . . . . . \$1.00 extra net.  
With suction arranged for hose . . . . . .50 " "

See pages 260 to 263 for Spray Nozzles, and pages 314 to 318 for Hose Couplings, etc.

"Spraying Catalogue and Calendar" furnished upon application.



**FIG. 905½.**

# GOULDS "STAR" DOUBLE-ACTING SPRAY PUMP.

WITH BRASS-LINED CYLINDER AND BRASS CHAMBER.

**Fig. 983** represents our "Star" Double-Acting Spray Pump, with brass-lined cylinder, brass chamber and plunger with brass valve seat. This upper differential plunger has one-half the displacement of the lower working plunger, which insures uniform discharge and pressure at nozzle. Pump has large air chamber reservoir and is capable of giving effective service. As shown in engraving, it has new style base adapted for either head or side of barrel. It has double discharges cut for  $\frac{3}{4}$ -inch pipe, but when ordered without hose or nozzle we plug one opening and fit the other with brass bushing and  $\frac{1}{2}$ -inch coupling for hose. Also supply brass suction strainer.

Prices do not include barrel.

FIG. 983.

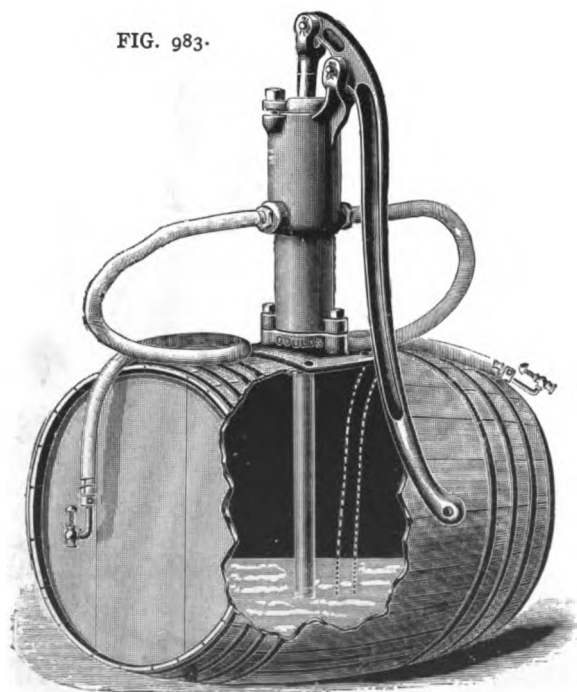


FIG. 983. SIZES, PRICES, ETC.

	Dia. Outer Cyl.	Suction.	Double Discharge.	Cipher.	Brass Lined.
Pump Only . . .	2½ in.	1 in. pipe.	¼ in. hose.	Zirca	\$9.00
<b>OUTFIT A, FOR Single Spray.</b>	<b>Fig. 983.</b> Spray Pump with 2½ ft. 1-in. iron suction pipe with brass strainer and one lead of 10 ft., ¼-in. discharge hose with "Seneca" (or other) spray nozzle. (Zircbi)				<b>\$13.00</b>
<b>OUTFIT B, FOR Double Spray (as shown in cut).</b>	<b>Fig. 983.</b> Spray Pump with 2½ ft. 1-in. iron suction pipe with brass strainer and two leads 10 ft. each, ¼-in. discharge hose with "Seneca" (or other) spray nozzles. (Zirced)				<b>\$16.00</b>
<b>OUTFIT C, Single Spray and Agitator.</b>	<b>Fig. 983.</b> Spray Pump with 2½ ft. 1-in. iron suction pipe with brass strainer, one lead 10 ft., ¼-in. discharge hose with "Seneca" (or other) spray nozzle, and 4 ft. iron pipe or hose for Agitator returning to barrel. (Zirceel)				<b>\$14.50</b>

Pump fitted with metallic lower valve . . . . . \$1.00 extra, net.

With suction arranged for hose . . . . . .50 " "

See pages 260 to 263 for Spray Nozzles and pages 314 to 318 for Hose, Couplings, etc.

"Spraying Catalogue and Calendar" furnished upon application.



# GOULDS SEMI-ROTARY "CLOCK" SPRAY PUMP.

WITH BRASS WORKING PARTS AND REVERSIBLE LEVER.

**Fig. 985** represents our Semi-Rotary Double-Acting "Clock" Spray Pump, with reversible lever and large air chamber. Working parts of Pump comprise brass double-wing oscillating piston with valves on each side of wing incased in cylinder, thus making it practically a metallic-fitted Pump. It can be attached to either side or top of barrel, and may be employed with single or double leads of hose for spraying trees, bushes, etc. Pump has double discharges cut for  $\frac{3}{4}$ -inch pipe, but when ordered without hose or nozzles we plug one opening and fit the other with brass bushing and half coupling for hose. Also, supply brass suction strainer. Prices do not include barrel.

"Brass" Pumps have brass case or shell and working parts; the air chamber and base are of iron.

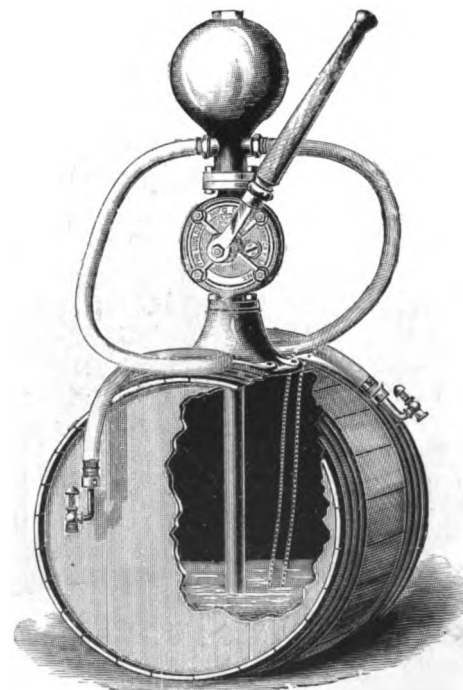
**FIG. 985. SIZES, PRICES, ETC.**

Pump Only . . . . .		No. 1.		No. 3.	
		Brass-fitted (Zither) \$10.00	Brass. (Varapa) \$12.50	Brass fitted (Zitern) \$14.00	Brass. (Vamped) \$19.50
<b>OUTFIT A, FOR Single Spray.</b>	<b>Fig. 985.</b> Spray Pump with $2\frac{1}{2}$ ft. 1-in. iron suc. pipe, with brass strainer and one lead of 10 ft. $\frac{1}{2}$ -in. discharge hose with "Seneca" (or other) spray nozzle . . . . .	(Zizel) \$14.00	(Vixeby) \$16.50	(Zobo) \$18.00	(Vanfat) \$23.50
<b>OUTFIT B, FOR Double Spray, as shown in cut</b>	<b>Fig. 985.</b> Spray Pump with $2\frac{1}{2}$ ft. 1-in. iron suc. pipe, with brass strainer and two leads of 10 ft. each $\frac{1}{2}$ -in. discharge hose with "Seneca" (or other) spray nozzles . . . . .	(Butab) \$17.00	(Butbal) \$19.50	(Zocco) \$21.00	(Vanner) \$26.50
<b>OUTFIT C, Single Spray AND Agitator.</b>	<b>Fig. 985.</b> Spray Pump with $2\frac{1}{2}$ ft. 1-in. iron suc. pipe, with brass strainer, one lead 10 ft. $\frac{1}{2}$ -in. discharge hose with "Seneca" (or other) spray nozzle and 4 ft. iron pipe or hose for Agitator returning to barrel . . . . .	(Butcar) \$15.50	(Butter) \$18.00	(Zoic) \$19.50	(Varec) \$25.00

With suction arranged for hose . . . . . \$0.50 extra, net.

See pages 260 to 263 for spray nozzles and pages 314 to 318 for Hose, Couplings, etc.

"Spraying Catalogue and Calendar" furnished upon application.



**FIG. 985.**

# GOULDS BARREL SPRAY CART.

WITH "STANDARD" DOUBLE-ACTING SPRAY PUMP.

**Fig. 1012** represents our Barrel Spray Cart, with Double-Acting Spray Pump, with brass-lined cylinder and brass-cased differential plunger with brass valve seat. This Pump is fully described under **Fig. 905½**, page 253, to which we would refer. Combination will be found very handy for spraying small orchards, gardens, etc. We can furnish this Spray Cart with any of our Spray Pumps, when so ordered, at corresponding prices.



**FIG. 1012.**

**FIG. 1012. SIZES, PRICES, ETC.**

	Dia. Outer Cyl.	Suction.	Double Dis.	Cipher.	Price.
<b>Pump Only.</b>	2½ in. 3 "	1 in. pipe. 1¼ "	½ in. hose and ¾ in. pipe. ¾ in. hose and 1 in. pipe.	Zuta Zymik	\$9.50 10.50
<b>Barrel Cart without Pump</b>	<b>Running Gear Only, or Cart with barrel Irons: no pump or barrel . . . . . (Ebbing)</b>				<b>\$15.00</b>
<b>OUTFIT A, for Single Spray.</b>	<b>Barrel Cart Complete, with Fig. 905½ 2½-in. Spray Pump, with 2½ ft. 1-in. iron suction pipe with brass strainer, and one lead 10 ft., ½-in. discharge hose, with "Seneca" (or other) spray nozzle . . . . . (Edenic)</b>				<b>\$31.00</b>
<b>OUTFIT AA.</b>	<b>Barrel Cart Complete, with Fig. 905½ 3-in. Spray Pump, fitted in same manner . . . (Edisa)</b>				<b>\$32.00</b>
<b>OUTFIT B, for Double Spray.</b>	<b>Barrel Cart Complete, with Fig. 905½ 2½-in. Spray Pump, with 2½ ft. 1-in. iron suction pipe with brass strainer and two leads, 10 ft. each., ½-in. discharge hose with "Seneca" (or other) spray nozzles . . . . . (Editor)</b>				<b>\$34.00</b>
<b>OUTFIT BB.</b>	<b>Barrel Cart Complete, with Fig. 905½ 3-in. Spray Pump, fitted in same manner . . . (Edisil)</b>				<b>\$35.00</b>
<b>OUTFIT C, Single Spray and Agitator.</b>	<b>Barrel Cart Complete, with Fig. 905½ 2½-in. Spray Pump, with 2½ ft. 1-in. iron suction pipe with brass strainer, one lead 10 ft., ½-in. discharge hose, with "Seneca" (or other) spray nozzle, and 4 ft. iron pipe or hose for Agitator returning to barrel . . . . . (Editioned)</b>				<b>\$32.50</b>
<b>OUTFIT CC.</b>	<b>Barrel Cart Complete, with Fig. 905½ 3-in. Spray Pump, fitted in same manner . . . (Edisob)</b>				<b>\$33.50</b>

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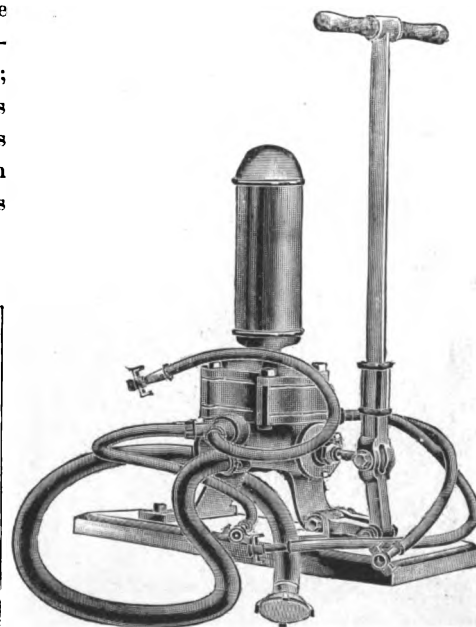
# GOULDS "SENTINEL" DOUBLE-ACTING SPRAY PUMP.

WITH BRASS-LINED CYLINDER, BRASS VALVES, PLUNGER ROD, ETC.

**Fig. 963** Shows our "Sentinel" Double-Acting Spray Pump, with brass-lined cylinder, brass valves and seats, plunger rod, etc., rendering it unaffected by acids, while the extra large air chamber specially adapts it for spraying tall trees. The suction and discharge valves are all grouped in valve chest and are readily accessible by removing air chamber. This Pump supplies the demand for a powerful Spray Pump of sufficient capacity to supply, if necessary, four leads of discharge hose. In large orchards or groves, such a Pump is a necessity, and our "Sentinel" Pump will be found to answer every requirement. Pump has double suction and discharge openings. Where ordered without hose or spray nozzles, we plug one suction and fit the other with brass bushing and one-half coupling for hose; also fit two discharges with bushings and half couplings for hose. Brass Y's or Siamese connections, to give two and four leads of hose, extra as given below. Where two leads of discharge hose are used, we fit for  $\frac{3}{4}$ -inch hose. Where four leads are used we fit for  $\frac{1}{2}$ -inch hose. Air chamber is  $21\frac{1}{2}$  inches high.

**FIG. 963. SIZES, PRICES, ETC.**

	Dia. Cyl.	Double Suc.	Double Dis.	Cipher.	Price.
<b>Pump Only . .</b>	3 in.	$1\frac{1}{4}$ in. pipe.	$\frac{1}{2}$ or $\frac{3}{4}$ in. hose.	Woolen	\$28.50
<b>OUTFIT A, FOR Two Leads.</b>	<b>Fig. 963.</b> "Sentinel" Spray Pump, with 5 ft. $1\frac{1}{4}$ -in. rubber suction hose and two leads, 25 ft. each, $\frac{1}{2}$ -in. discharge hose with "Calla" (or other) spray nozzles, couplings and hose bands, complete . . . (Duslap)				\$45.50
<b>OUTFIT B, FOR Four Leads.</b>	<b>Fig. 963.</b> "Sentinel" Spray Pump, with 5 ft. $1\frac{1}{4}$ -in. rubber suction hose and four leads, 25 ft. each, $\frac{1}{2}$ -in. discharge hose with "Calla" (or other) spray nozzles, couplings and hose bands, complete . . . (Dunled)				\$60.50



**FIG. 963.**

- Fig. 48.** Bamboo Extension, complete with brass stop cock and hose coupling . . . . . (Zonals) \$4.00  
**Fig. 52.** "Pacific Cyclone" Nozzle . . . . . (Zonate) .60  
**Fig. 49.** Brass Y, with discharges for  $\frac{1}{2}$ -inch or  $\frac{3}{4}$ -inch hose, as ordered . . . . . (Zonava) .80

See pages 260 to 263 for Spray Nozzles, and pages 314 to 318 for Hose, Couplings, etc.

"Spraying Catalogue and Calendar" furnished upon application.

# GOULDS "HANDY" KNAPSACK PUMP.

FOR VINEYARD, ORCHARD OR FIELD SERVICE.

**Fig. 989** represents our Knapsack Spray Pump, which we have recently improved, and which will be found the best Pump of this class upon the market. It is made entirely of brass and copper, with ball valves and metal plunger, all of which are easily accessible and can be, therefore, readily examined and repaired. It is so arranged and stayed in the reservoir that it is capable of doing long and continuous service. The discharge is at the bottom, and the Pump can be entirely drained of the liquid. Any leakage of fluid out of the stuffing box will drip back into the tank. The change from the right to the left hand is extremely simple, and made by disconnecting the bearer link

and bringing it over to the jaw provided for it on the other side.

An eye on the top and back of knapsack enables one to suspend it steadily when he wishes to take it off his back.

The reservoir is made of heavy copper, and will hold about five gallons of liquid.

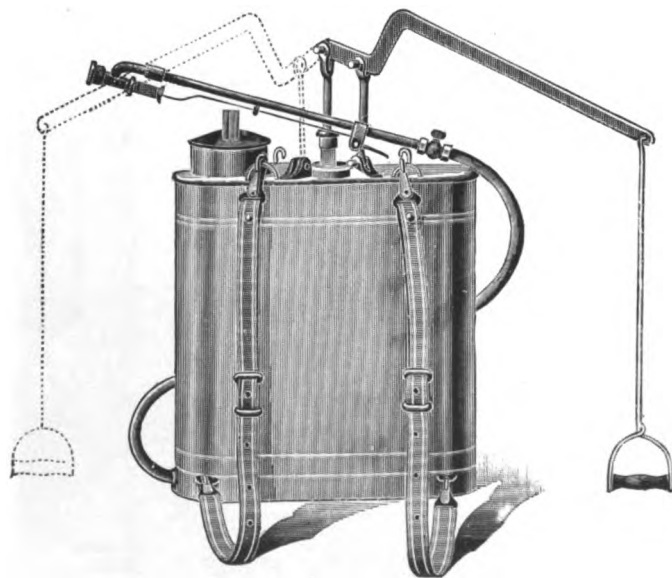
## SIZE, PRICE, ETC.

**Fig. 989.** "Handy" Knapsack Sprayer, complete as shown in cut, with  $3\frac{1}{2}$  feet of  $\frac{3}{4}$ -inch discharge hose, "Vermorel" Nozzle and lance for degorger. (Wrybill) \$15.00

*N. B.*—When so desired, we will furnish an Agitator at an extra price of \$0.50, net.

We will furnish with any style Spray Nozzle, but recommend either **Fig. 55**, "Vermorel," or **Fig. 62**, "Masson."

"Spraying Catalogue and Calendar" furnished upon application.



**FIG. 989.**

## GOULDS PORTABLE BRASS FORCE PUMPS.

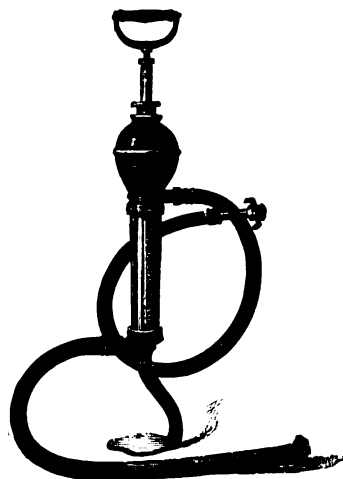


FIG. 561 1/2.



FIG. 1011.

Fig. 561 1/2 represents a compact and powerful Brass Force Pump arranged with suction and discharge hose and "Calla" Spray Nozzle. With this nozzle a solid stream may be thrown, a fine spray and a coarse spray. Pump has brass cylinder, plunger and rod; the last is made specially strong. Pump is particularly adapted for washing windows and wagons, spraying flowers in conservatories, gardens, etc. Its weight is only eight pounds.

### FIG. 561 1/2. PRICE.

With 2 1/2 ft. 3/4 in. suction and 3 ft. 1/2 in. discharge hose and "Calla" Spray Nozzle . . . . . (Velveub)	\$9.00
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Fig. 642 1/2, as per illustration, is a Double-Acting Portable Force Pump. It is made of brass and therefore impervious to the action of acids and liquids and will not rust nor corrode. Pump is placed directly in water or other liquid, insuring a perfect suction. It is furnished complete with malleable foot-rest and "Calla" Spray Nozzle, which allows solid stream and large or small spray. Pump may be used for washing windows, wagons, in conservatories, gardens, etc., and for general spraying purposes.

### FIG. 642 1/2. PRICE.

With 3 ft. 1/2 in. discharge hose and "Calla" Spray Nozzle . . . . . (Vendac)	\$9.00
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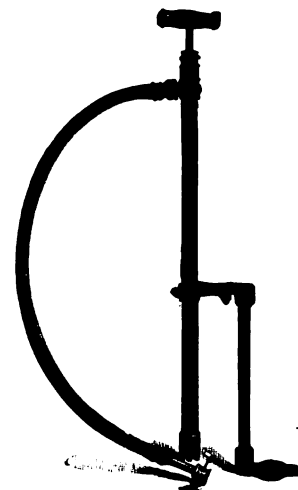


FIG. 642 1/2.

Fig. 1011, Portable Brass Spray Pump, is regularly furnished with "Calla" Nozzle, which may be graduated to give solid stream, coarse or fine spray. Pump has brass cylinder and air chamber, steel rod, and is furnished complete with foot-rest and discharge hose. Pump is designed to set in pail or vessel of water, with foot-rest outside. Pump is also arranged to discharge a fine jet in bottom of bucket. This answers the same purpose as an agitator and will specially recommend it for spraying.

### FIG. 1011. PRICE.

With 3 1/2 ft. 1/2 in. discharge hose and "Calla" Spray Nozzle . . . . . (Vendibil)	\$9.00
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# SPRAY NOZZLES, FOR ORCHARD, FIELD AND VINEYARD.

The selection of Spray Nozzles suitable for the class of spraying to be done, is second only to the question of Pumps. In fact, the spray nozzle should be selected according to the conditions, as whether wanted for orchard, field service or vineyards. In young orchards, the small trees can be more easily reached, and a spray nozzle which shall give a very fine, mist-like spray is the most economical to use. This applies, as well, to spraying grape vines, berry bushes, etc. In old orchards, the spraying of large trees calls for a spray nozzle which shall give a coarser discharge and at the same time can be thrown to greater distances.

We have made a special study of Spray Nozzles, and from a large number of patterns offer the following, which our own practical experiments have proved the best for general service.

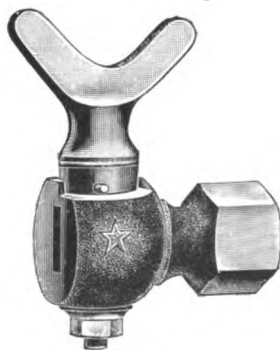


FIG. 62.

## “MASSON” SPRAY NOZZLE.

Fig. 62, “Masson” Spray Nozzle is a good all-around nozzle. It can be graduated to give a very fine spray for close work, such as vines and bushes, and also to give effective discharge for spraying young trees. Nozzle can be cleaned by simply turning plug across the opening. It is the most economical nozzle made.

Price, cut for $\frac{1}{4}$ -inch pipe, also for $\frac{1}{2}$ -inch hose when so ordered . . . . .	(Zufva) \$1.00
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## “MASSON” SPRAY NOZZLE, WITH STICK HANDLE.

Fig. 63, “Masson” Spray Nozzle has shank with four openings, so that stick can be inserted at different angles. This stick handle will be found very convenient in directing the discharge, and obviates the possibility of liquid running back on the hands.

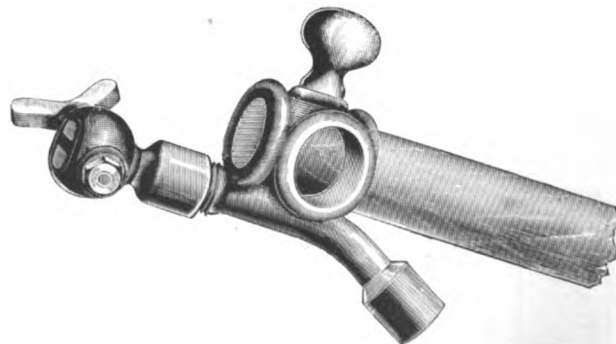


FIG. 63.

Price, cut for $\frac{1}{4}$ -inch pipe, also for $\frac{1}{2}$ -inch hose when so ordered . . . . .	(Zufwy) \$1.50
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## "MASSON" SPRAY NOZZLE WITH EXTENSION.

Fig. 64, "Masson" Spray Nozzle with Extension, is about 13 inches long and answers the purpose of an extension to reach in between the leaves and branches.

Price, cut for  $\frac{1}{4}$ -in. pipe, also for  $\frac{1}{2}$ -in. hose when so ordered . . . . . (Zugat) \$2.50

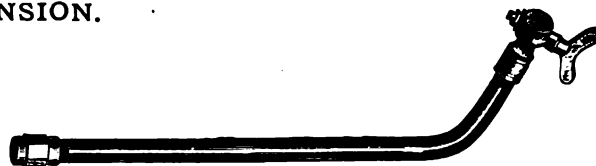


FIG. 64.

## "SENECA" SPRAY NOZZLE.

Fig. 81, "Seneca" Spray Nozzle, is similar in appearance to the "Masson," but gives a different form of discharge, which may be graduated from fine spray for small trees to a coarser spray for larger trees. It is essentially an orchard spray nozzle.

Price, cut for  $\frac{1}{4}$ -in pipe, also for  $\frac{1}{2}$ -in. hose when so ordered . . . . . (Zugbor) \$1.00



FIG. 81.

## "SENECA" SPRAY NOZZLE WITH STICK HANDLE.

Fig. 82, "Seneca" Spray Nozzle, has shank with four openings to receive stick at different angles. Its operation is the same as Fig. 63, described on page 260.

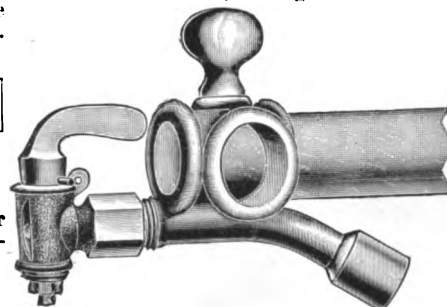


FIG. 82.

Price, cut for  $\frac{1}{4}$ -in. pipe, also for  $\frac{1}{2}$ -in. hose when so ordered . . . . . (Zufud) \$1.50

## "VERMOREL" SPRAY NOZZLE WITH DEGORGER.

Fig. 55, "Vermorel" Spray Nozzle with Degorger, is best adapted for close range spraying, such as vines, bushes, etc. It is arranged with stuffing box, so that in cleaning, the liquid cannot wet the operator. The adjustment of spray is fixed by the openings in two caps, which we furnish with each nozzle. One of these caps will give fine, the other a coarse spray.

Price, cut for  $\frac{1}{4}$ -in. pipe, also for  $\frac{1}{2}$ -in. hose when so ordered . . . . . (Zoide) \$1.00

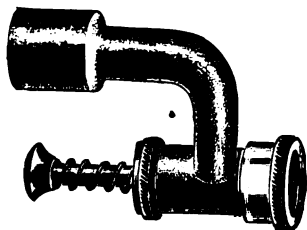


FIG. 55.

## "VERMOREL" SPRAY NOZZLE WITH LANCE.

Fig. 57, "Vermorel" Nozzle with Lance, is about 18 inches long, and provided with a degorger, operated by means of the lever and spring, working through the stuffing box. A stop cock at the end of nozzle to which hose is attached may be used to shut off the spray and save loss of liquid. This nozzle is specially designed to be used in connection with our Fig. 989, Knapsack Spray Pump.



FIG. 57.

While we can arrange them for  $\frac{1}{4}$ -inch pipe or  $\frac{1}{2}$ -inch hose, we regularly fit as follows:

Price, fitted for  $\frac{3}{4}$ -in. hose . . . . . (Zokor) \$2.50



FIG. 69.

### "CALLA" SPRAY NOZZLE.

Fig. 69, "Calla" Spray Nozzle, can be changed from solid stream to finest spray by adjustment of slide with perforated holes of different sizes. It is best adapted for sprinkling or spraying where a coarse discharge is required.

Price, cut for $\frac{1}{2}$ -inch hose . . . . .	(Vignia) \$1.00
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### "CYCLONE" SPRAY NOZZLE.

Fig. 51, "Cyclone" Spray Nozzle, has two caps, one to give fine, the other to give coarse discharge. This is largely used in certain sections in connection with Figs. 48 and 72, Spray Pump Extensions.

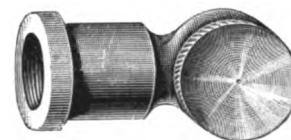
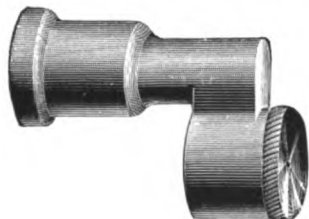


FIG. 51.

Price, cut for $\frac{1}{4}$ -inch pipe . . . . .	(Zonard) \$0.50
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### "PACIFIC CYCLONE" SPRAY NOZZLE.

Fig. 52, "Pacific Cyclone" Spray Nozzle, is same type as Fig. 51, described above, except the discharge is in front instead of at the side.



Price, cut for $\frac{1}{4}$ -inch pipe . . . . .	(Zonate) \$0.60
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### BRASS STOP COCK.

Fig. 85, Brass Stop Cock, is designed to be used with any of our Spray Pumps to shut off spray quickly and save loss of liquid. It has shank for attaching  $\frac{1}{2}$ -inch discharge hose and  $\frac{1}{4}$ -inch male pipe thread to attach spray nozzle. Figs. 62, 82, 51 or 55 Spray Nozzles may be used.



FIG. 85.

Price, as above . . . . .	(Zorned) \$0.50
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### COUPLING FOR HOSE AND IRON PIPE.

Fig. 65, Coupling for Hose and Iron Pipe, is used on end of discharge hose on Spray Pumps to connect Spray Nozzles, such as Figs. 62, 81, 55, etc.

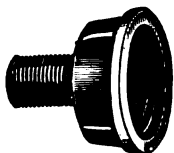


FIG. 65.

Price, cut for $\frac{1}{4}$ -inch pipe and $\frac{1}{2}$ or $\frac{3}{4}$ inch hose . . . . .	(Zornia) \$0.25
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### CONNECTION FOR HOSE AND IRON PIPE.

Fig. 67, Connection for Hose and Iron Pipe, is used on discharge hose of Knapsack Spray Pumps, to connect to Spray Nozzles, such as Figs. 62, 81, 55, etc.



FIG. 67.

Price, cut for $\frac{1}{4}$ -inch pipe and $\frac{1}{2}$ -inch hose . . . . .	(Zornod) \$0.25
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## SPRAY PUMP BAMBOO EXTENSION.

Fig. 48 represents our Bamboo Extension, to be used on Spray Pumps in connection with discharge hose, to reach higher branches of trees, etc. It has  $\frac{1}{4}$ -inch pipe inside of bamboo, and is arranged with brass stop cock and coupling for  $\frac{1}{2}$  or  $\frac{3}{4}$  inch hose at one end; the other end is cut for  $\frac{1}{4}$ -inch pipe to connect to Spray Nozzle. Almost any of our Spray Nozzles may be used with this Bamboo Extension, but either our Fig. 55 "Vermorel" Nozzle or our Figs. 51 and 52 "Cyclone" Nozzles are usually selected. These, however, are not included in our price.

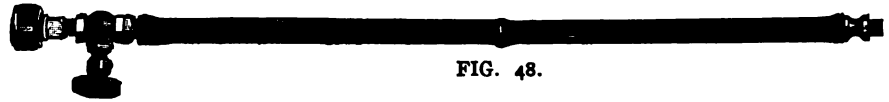


FIG. 48.

Price, complete as above . . . . .	(Zonals) \$4.00
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## SPRAY PUMP BRASS PIPE EXTENSION.

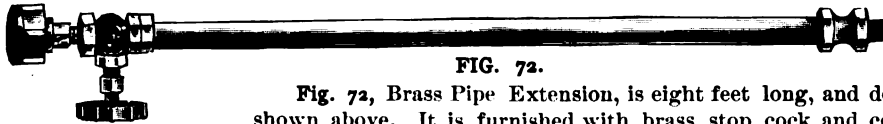


FIG. 72.

Fig. 72, Brass Pipe Extension, is eight feet long, and designed for same purpose as Fig. 48, shown above. It is furnished with brass stop cock and coupling for  $\frac{1}{2}$  or  $\frac{3}{4}$  inch hose at one end; the other end is cut for  $\frac{1}{4}$ -inch pipe to connect to Spray Nozzle. Figs. 55, 51 and 52 are usually selected.

Price, complete as above . . . . .	(Zonaul) \$5.00
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## BRASS Y, OR SIAMESE CONNECTION.

Fig. 49, Brass Y, is cut  $\frac{3}{4}$  or 1 inch male thread on inlet as ordered, and  $\frac{1}{2}$  or  $\frac{3}{4}$  inch male thread on lateral discharges—these according to number of leads of hose used. While it may be employed with any of our Pumps, it is specially designed to be used with Fig. 963, "Sentinel" Spray Pump, page 257.



FIG. 49.

Price, complete as above . . . . .	(Zonava) \$0.80
------------------------------------	-----------------

Fig. 49½. Brass Y, is the same in all respects as Fig. 49 described above, except it has female thread on inlet. Lateral discharge same as noted.



FIG. 49½.

Price, complete as above . . . . .	(Zormad) \$0.80
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## BRASS SUCTION PIPE STRAINERS.

Fig. 70, Brass Suction Pipe Strainer, is fitted for hose as follows:

Price, 1 inch . . . . .	(Zonawl) \$0.50
" 1½ " . . . . .	(Zorlun) 1.00



FIG. 70.

Fig. 71, Brass Suction Pipe Strainer, is fitted for wrought iron pipe as follows:

Price, 1 inch . . . . .	(Zorlyd) \$0.50
-------------------------	-----------------



FIG. 71.

## GOULDS GARDEN OR FIRE ENGINE.

Fig. 304 represents our Garden Engine with either wood or iron handles, as ordered. The Pump is placed inside of box of dimensions suitably large to hold about a barrel of water, and being on wheels is easily moved to any place where it is desirable to use it. Pump has brass cased rod, revolving bearer top and extra long handle, which gives a powerful leverage.

Below we give prices on this Engine, complete as per cut, with 3 feet of 1-inch discharge hose and a discharge pipe.

FIG. 304. SIZE, PRICES, ETC.

	Dia. Pump Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	Cipher.	Price.
With iron handles	3 in.	6 in.	.18 gal.	1½ in.	1 in. hose.	Driven	\$26.00
With wood handles	3 "	6 "	.18 "	1½ "	1 "	Drolley	25.00

We can also line box with sheet lead at extra net charge of \$5.00, or with galvanized iron at an extra net charge of \$3.00, rendering it unaffected by swelling or shrinking of the wood.

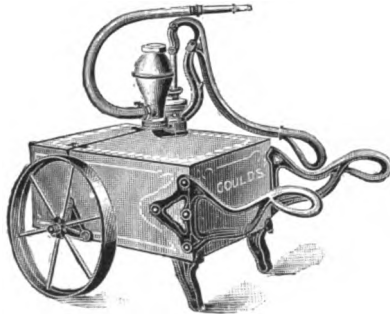


FIG. 304.

## GOULDS GARDEN OR FIRE ENGINE, SIDE SUCTION.

Fig. 309 is very similar to Fig. 304, except that the side of box is fitted for attaching suction hose. Fitted in this manner, the Engine can be moved to any convenient point for draughting water.

Below we give prices on Engine with 3 feet of 1-inch discharge hose and brass discharge pipe. No suction hose is included, but can furnish as ordered at market rates.

FIG. 309. SIZE, PRICES, ETC.

	Dia. Pump Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	Cipher.	Price.
With iron handles	3 in.	6 in.	.18 gal.	1½ in. hose.	1 in. hose.	Drown	\$29.00
With wood handles	3 "	6 "	.18 "	1½ "	1 "	Drug	28.00

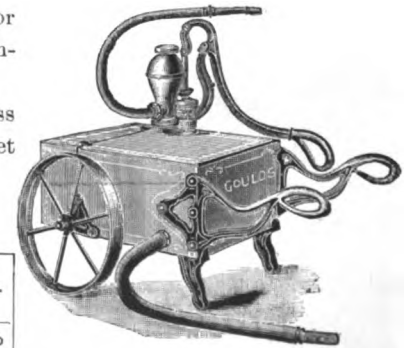


FIG. 309.

We can also line this box with sheet lead at an extra net charge of \$5.00, or with galvanized iron at an extra net charge of \$3.00, rendering it unaffected by swelling or shrinking of the wood.

Longer lengths of hose furnished, if ordered, at extra price. See pages 314 to 318, for lists of Hose, Couplings, etc.

# GOULDS DOUBLE-ACTING GARDEN OR FIRE ENGINE.

WITH WROUGHT-IRON BARROW AND REEL FOR HOSE.

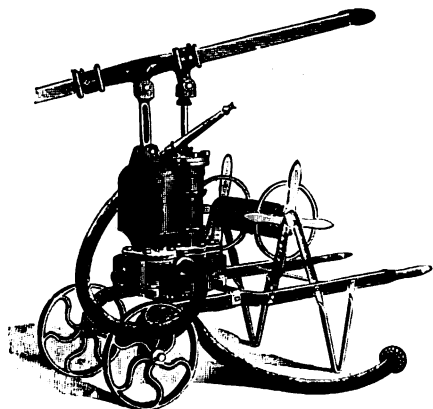


FIG. 1008 1/2.

Fig. 1008 1/2 represents our Double-Acting Garden or Fire Engine, on wrought-iron barrow, with wheels and hose reel. It has brass-lined cylinder and rubber ball valves. Four to six men can operate the Engine to good effect. Hose reel will carry 50 to 75 feet of 1 1/2-inch three-ply rubber hose.

We list Engine complete, as per cut, with six feet 2-inch spiral suction hose, and twelve feet 1 1/2-inch discharge hose; brass hose pipe, sprinkler, hose coupling and suction basket.

FIG. 1008 1/2. SIZE, PRICE, ETC.

Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	Cipher.	Price.
5 in.	8 in.	1.36 gal.	2 in. hose.	1 1/2 in. hose.	Baldrick	\$75.00

# GOULDS UNION HAND FIRE ENGINE.

Fig. 766 represents our Fig. 284 Two-Cylinder Force Pump, mounted upon substantial truck. The tank is made of the best galvanized wrought iron and sets on a very heavy and strongly bolted wood frame. It can be operated by from two to six men, and will draw from the tank or through suction hose from any other supply. The knees are so constructed that they will fold up while being moved and when in place hold the engine firmly on the ground when in operation. Below we give price on Engine complete. No suction or discharge hose is included in these prices, but we can furnish same at lowest market rates.

FIG. 766. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	IRON CYLINDERS.		BRASS CYLINDERS.	
					Cipher.	Price.	Cipher.	Price.
3 1/2 in.	6 in.	.50 gal.	2 1/2 in. hose.	1 1/2 in. hose.	Vivify	\$90.00	Vixenly	\$100.00
4 " "	6 " "	.65 " "	2 1/2 " "	1 1/2 " "	Vixane	100.00	Vixind	120.00
4 1/2 " "	6 " "	.83 " "	3 " "	2 " "	Vixen	120.00	Vizard	145.00

See pages 314 to 318 for lists of Hose, Couplings, Discharge Pipes, Strainers, etc.

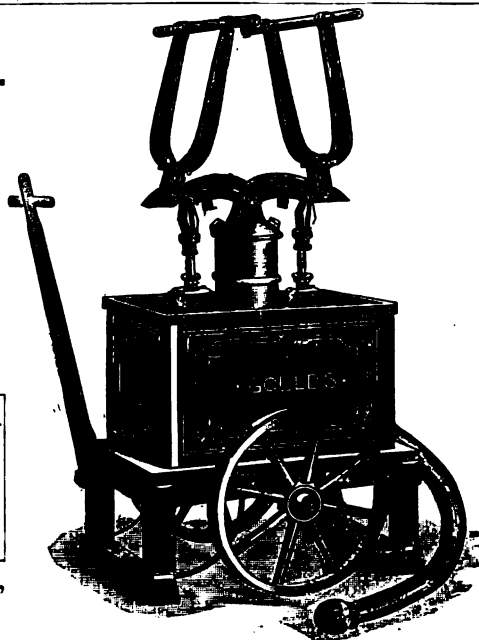


FIG. 766.

# GOULDS DOUBLE-ACTING GARDEN OR FIRE ENGINE.

BRASS-LINED CYLINDER, MOUNTED ON WROUGHT-IRON BARROW.



FIG. 630.

Fig. 630 shows a portable Double-Acting Lift and Force Pump. The cylinder is iron, brass lined. Four to six men can operate the Engine at one time. It will throw a fine stream through a half-inch nozzle from 80 to 100 feet.

One bolt and nut holds in place a door at either end of bed plate, which can be opened to get at the rubber ball valves.

Below we give price of Engine complete as per cut, with 6 feet 2-inch spiral suction hose and 12 feet 1½-inch discharge hose, brass hose pipe and spreader, hose couplings, suction basket, etc.

FIG. 630. SIZE, PRICE, ETC.

Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	Cipher.	BRASS LINED.
5 in.	8 in.	1.36 gals.	2 in. hose.	1½ in. hose.	Racer	\$58.00

Longer lengths of hose can be furnished, if desired, at extra price. See pages 314 to 318 for lists of Hose, Couplings, etc.

# GOULDS DOUBLE-ACTING GARDEN OR FIRE ENGINE.

BRASS-LINED CYLINDER AND WROUGHT-IRON EXTENSION LEVERS.

This is the same Engine as described above, except that this is provided with wrought-iron adjustable arms with wood brakes, on which six to eight men can work, and is consequently capable of performing greater service. Below we give price of Engine complete as per cut, with 6 feet 2-inch spiral suction hose and 12 feet 1½-inch discharge hose, brass hose pipe and spreader, hose couplings, suction baskets, etc.

FIG. 653. SIZE, PRICE, ETC.

Dia. Cyl.	Stroke.	Capacity per Rev.	Suction.	Discharge.	Cipher.	BRASS LINED.
5 in.	8 in.	1.36 gals.	2 in. hose.	1½ in. hose.	Ravelus	\$64.00

Longer lengths of hose can be furnished, if desired, at extra price. See pages 314 to 318 for lists of Hose, Couplings, etc.

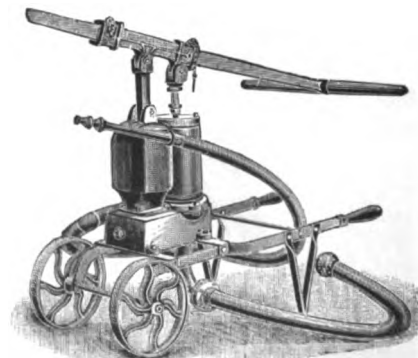


FIG. 653.

# HAND GARDEN FORCE PUMP.

MOUNTED ON WOODEN BARROW.



FIG. 640.

The cut represents one of our well known Hand Force Pumps mounted on wooden barrow. This barrow is light, and the whole can be easily moved about the yard or garden for supplying water for plants and trees or watering lawns, etc. This engine has no useless parts, and is cheap, simple and effective.

Below we give prices complete as per cut, with 6 feet 1¼-inch suction hose and 3 feet 1-inch discharge hose, hose couplings, discharge pipe, suction basket, etc.

FIG. 640. SIZES, PRICES, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	Cipher.	Price.
2½ in. 3 "	6 in. 6 "	.13 gal. .18 "	1½ in. hose. 1¼ "	1 in. hose. 1 "	Rain Raise	\$23.00 26.50

Longer lengths of hose will be furnished, if desired, at extra price. See pages 314 to 318 for lists on Hose, Couplings, etc.

# GARDEN OR FIRE ENGINE.

WITH WOODEN TANK.

Fig. 456 represents a handy Garden or Fire Engine. Pump is placed in tank which has a capacity of about two barrels. Water can be taken either from the box or, by attaching suction hose to the coupling at the end of the box, be drafted from other sources. The Engine is easily handled, and can be turned in its own length. The long handle on Pump gives a powerful leverage. Each machine has 5 feet 1-inch discharge hose and hose pipe.

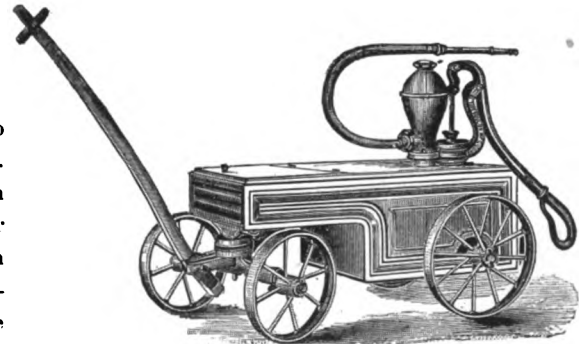


FIG. 456.

FIG. 456. SIZE, PRICE, ETC.

Dia. Cyl.	Stroke.	Capacity per Stroke.	Suction.	Discharge.	IRON.		BRASS LINED CYL.	
					Cipher.	Price.	Cipher.	Price.
4 in.	8 in.	.44 gal.	1½ in. hose.	1 in. hose.	Daylock	\$80.00	Daylud	\$92.00

Box lined with heavy sheet lead, add \$10.00 to price.

# GOULDS SWAN-NECK VILLAGE FIRE ENGINE.

WITH GUN METAL CYLINDERS.

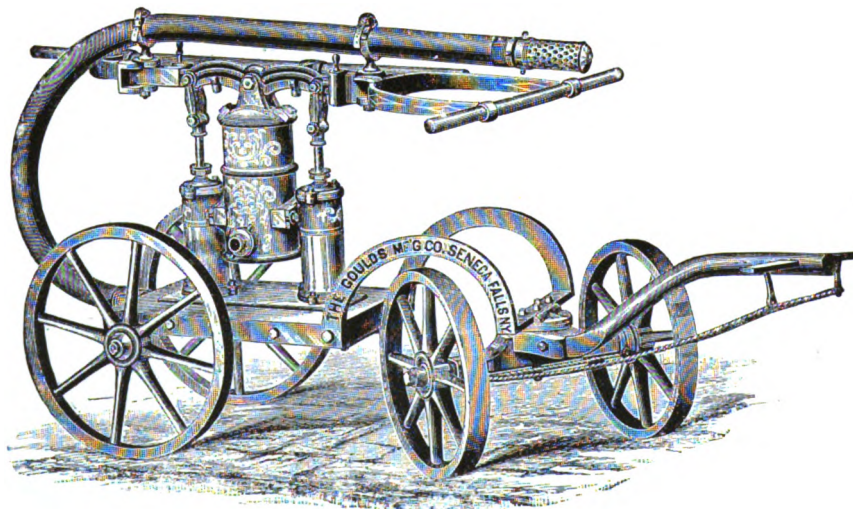


FIG. 465.

Fig. 465 represents our Swan-Neck Village Fire Engine with two gun-metal cylinders and arranged to be drawn by hand. This Engine is self-contained, and the crane-neck allows it to be turned in its own length. The Pump is securely fastened to an iron bed-plate, doing away with the expense of a reservoir or box. Engine has strong wooden wheels with wrought-iron tires, hard-wood pole and brakes (which are reversible and folding), fifth wheel, etc. The valves are of an approved pattern, and everything as complete as first-class workmanship and the best of materials can make them.

From eight to twelve men can work on the brakes and with this force an effective fire stream can be thrown from 100 to 125 feet horizontally or 60 to 90 feet vertically.

FIG. 465. SIZES, PRICES, ETC.

No.	Diameter Cylinders.	Stroke.	Capacity per Rev.	Suction.	Discharge.	GUN METAL CYLINDERS.	
						Cipher.	Price.
10	4½ in.	6 in.	.83 gal.	2¼ in. hose.	1½ in. hose.	Glassell Gleam	\$200.00
16	6 "	8 "	1.96 "	3 "	2 "		280.00

Prices do not include any hose. For list on Hose, Couplings, etc., see pages 314 to 318. Any length of drag rope can be furnished at extra price.

# GOULDS VILLAGE FIRE ENGINE.

WITH FOLDING BRAKES FOR TEN MEN TO OPERATE.

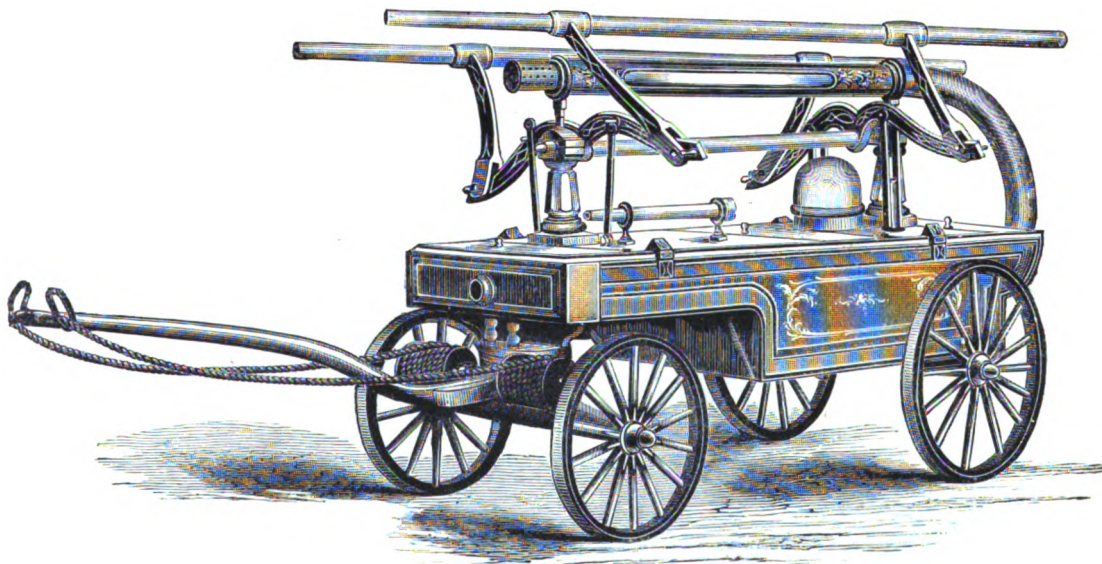


FIG. 539.

**Fig. 539** represents our Village Fire Engine with folding brakes for ten men. This Engine is very strong and durable and specially adapted for use in small towns where the streets are poorly paved and Engine meets with the roughest kind of service. Engine has brass cylinders, brass pistons, iron-bound wheels with metal hubs, heavy iron axle and folding brakes with automatic locks. It will throw one  $\frac{5}{8}$ -inch stream about 110 feet. It is equipped with one nickel-plated play pipe and extra nozzles, one pair suction hose couplings and suction strainer, rope reel, drag rope and all necessary wrenches.

Price does not include suction hose, which we can supply as ordered at market rates.

## SIZE, PRICE, ETC.

**Fig. 539, 4  $\frac{1}{2}$ -in. x 7 in. Cylinders, fitted for 2  $\frac{1}{4}$ -in. suction hose and 2-inch discharge hose. Complete as above . . . . . (Laden) \$375.00**



# GOULDS PIANO STYLE FIRE ENGINE.

WITH FOLDING BRAKES FOR TWENTY MEN TO OPERATE.

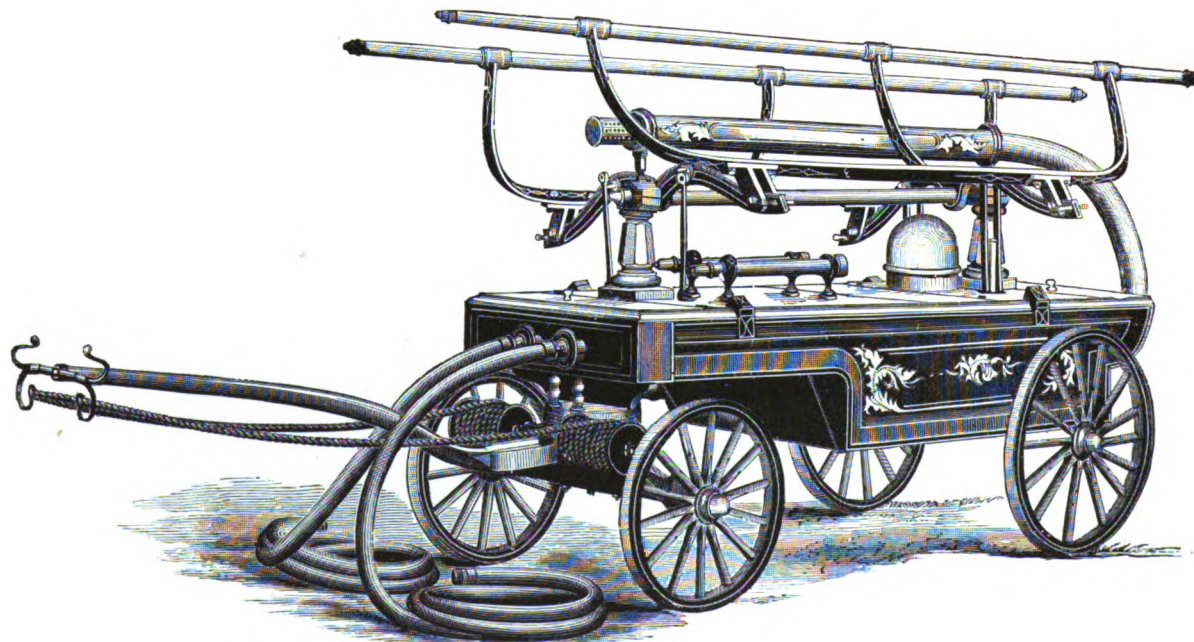


FIG. 460.

Fig. 460 represents our Two-Stream Piano Style Fire Engine, with folding brakes for twenty men. It has brass cylinders, pistons, valves and valve seats, wrought-iron piston rods and folding brakes with automatic locks and extra large air chamber. It has cut-off valves, so either one or two leads of hose can be used. It will throw one  $\frac{3}{4}$ -inch stream 140 feet, or two  $\frac{5}{8}$ -inch streams from 100 to 110 feet. We regularly equip with 12 feet,  $3\frac{1}{2}$ -inch spiral suction hose and brass suction strainer, two nickel-plated blow pipes and extra nozzles, rope reel, drag rope and all necessary wrenches.

## SIZE, PRICE, ETC.

Fig. 460. 7" x 7" Cylinders, fitted with 12 feet  $3\frac{1}{2}$ -in. suction hose, and for two leads, 2-in. discharge hose. Complete as above.  
(Landed) \$750.00



## FACTORY HOSE CART.

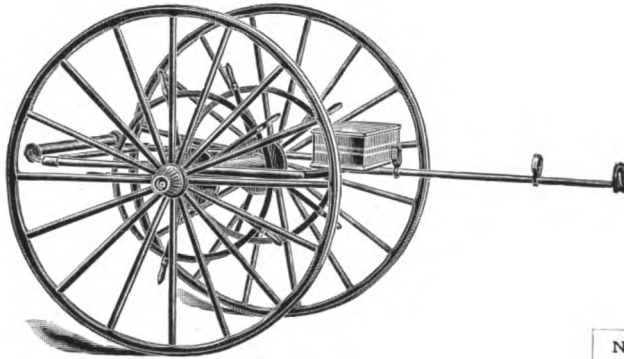


FIG. 530.

Fig. 530 represents our most popular style of cheap Hose Cart. It is constructed of the best materials and is designed specially for village fire departments, lumber yards, factories, etc.

FIG. 530. SIZES, PRICES, ETC.

No. 1, 4 ft. wheels, carrying capacity about	250 feet	2½ in.	rubber hose.
	or 400 "	2 "	" "
	or 800 "	2 "	" linen "
	or 1000 "	1½ "	" "
(Blushe) \$40.00			
No. 2, 5 ft. wheels, carrying capacity about	800 feet	2 in.	cotton hose.
	or 500 "	2½ "	" "
	or 400 "	2½ "	" rubber "
			(Blushf) \$70.00

## BALANCED HOSE CART.

Fig. 542 Hose Cart is so balanced that there is no weight on the tongue, making it easily handled with a heavy weight of wet hose. It is furnished with handles on end of reel spokes for reeling. With each cart goes drag rope, reel, axe, crow-bar and tool box.

FIG. 542. SIZE, PRICE, ETC.

No. 3, 5 ft. wheels, carrying capacity about 1000 ft. 1½ in.			{ Cotton Rubber Lined Mill Hose. Rubber Hose. " "
or	800 "	2 "	
or	500 "	2½ "	
or	600 "	1½ "	
or	450 "	2 "	
or	400 "	2½ "	
(Waragl) \$100.00			

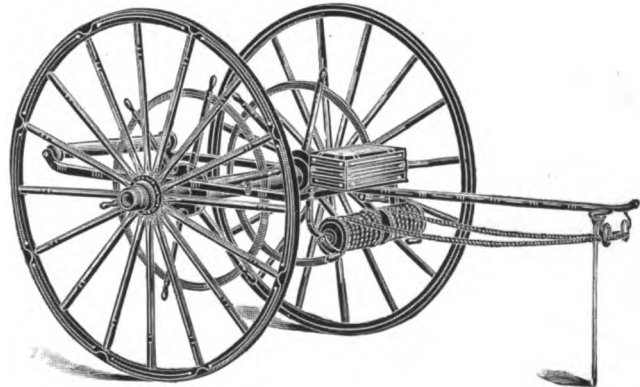
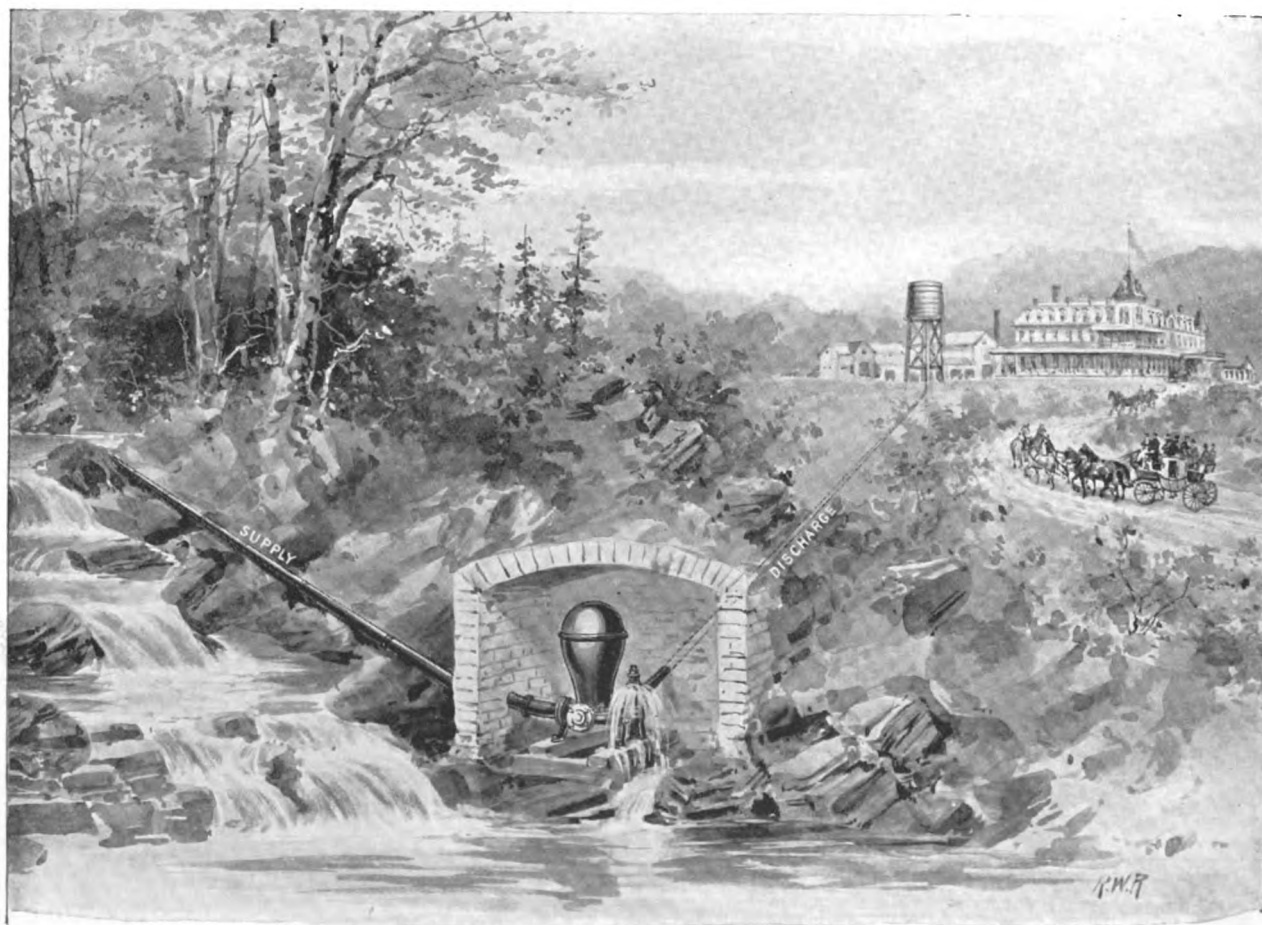


FIG. 542.



GOULDS IMPROVED HYDRAULIC RAM IN OPERATION.

See following pages for description and prices.

# GOULDS IMPROVED HYDRAULIC RAMS.

FOR SUPPLYING DWELLINGS, FACTORIES, RAILROAD STATIONS, STOCK YARDS, ETC., WITH RUNNING WATER.

**THE HYDRAULIC RAM AS WE BUILD IT** to-day represents the most efficient and automatic labor-saving device known for raising water any distance where a sufficient supply and head are attainable, and the slight expense for first outlay and maintenance considered render them most desirable for supplying running water in any quantity to residences, villages, etc. With an experience of 35 years in their manufacture, and a practical knowledge of the requirements necessary for their successful operation, we are able to offer the most perfect and efficient Ram in the market. Our castings are all heavy in pattern and of proportionate strength. The air chambers are larger than those of any other Ram, thus relieving it of all undue strain and aiding its working, while the valve stem and case (made of best bronze metal) are of a new and improved design calculated to develop the greatest possible efficiency.

The cut on opposite page represents one of our Improved Hydraulic Rams in operation, furnishing water for house, fountain, barns, etc. A few words will explain our plan. The water is taken from the supply at the left through the drive pipe—the length and fall of same to be determined by results required—and forced upwards through the discharge pipe to the point of delivery. The conditions and requirements under which Rams are operated are so varied that we have thought best to treat these under separate heads, believing our customers will appreciate this arrangement which will enable each purchaser to make his own selection from our goods, or furnish such data that we can readily make estimates and recommendations.

**HEAD OF FALL OF DRIVE PIPE.**—Rams will work, and successfully, where the spring or brook is only 3 feet higher than the Ram; yet, as the height or head increases, the more powerfully the Ram operates, and its ability to force water to greater elevation and distance correspondingly strengthens. The best wearing results will be secured where the head of fall does not exceed 10 feet. The head on the discharge pipe may be from five to ten times the head on the drive pipe.

Thus, as shown in our Table of TESTS, we have a varying head of 10 to 25 feet, proportioned to height water is to be raised and quantity required. As a specific example, we might say a fall of 10 feet from the brook or spring to the Ram is sufficient to raise water to any point, say, 150 feet above the machine, while the same amount of fall would also raise water to a point considerably higher, though the quantity of water discharged will be proportionately diminished as the height and distance increase.

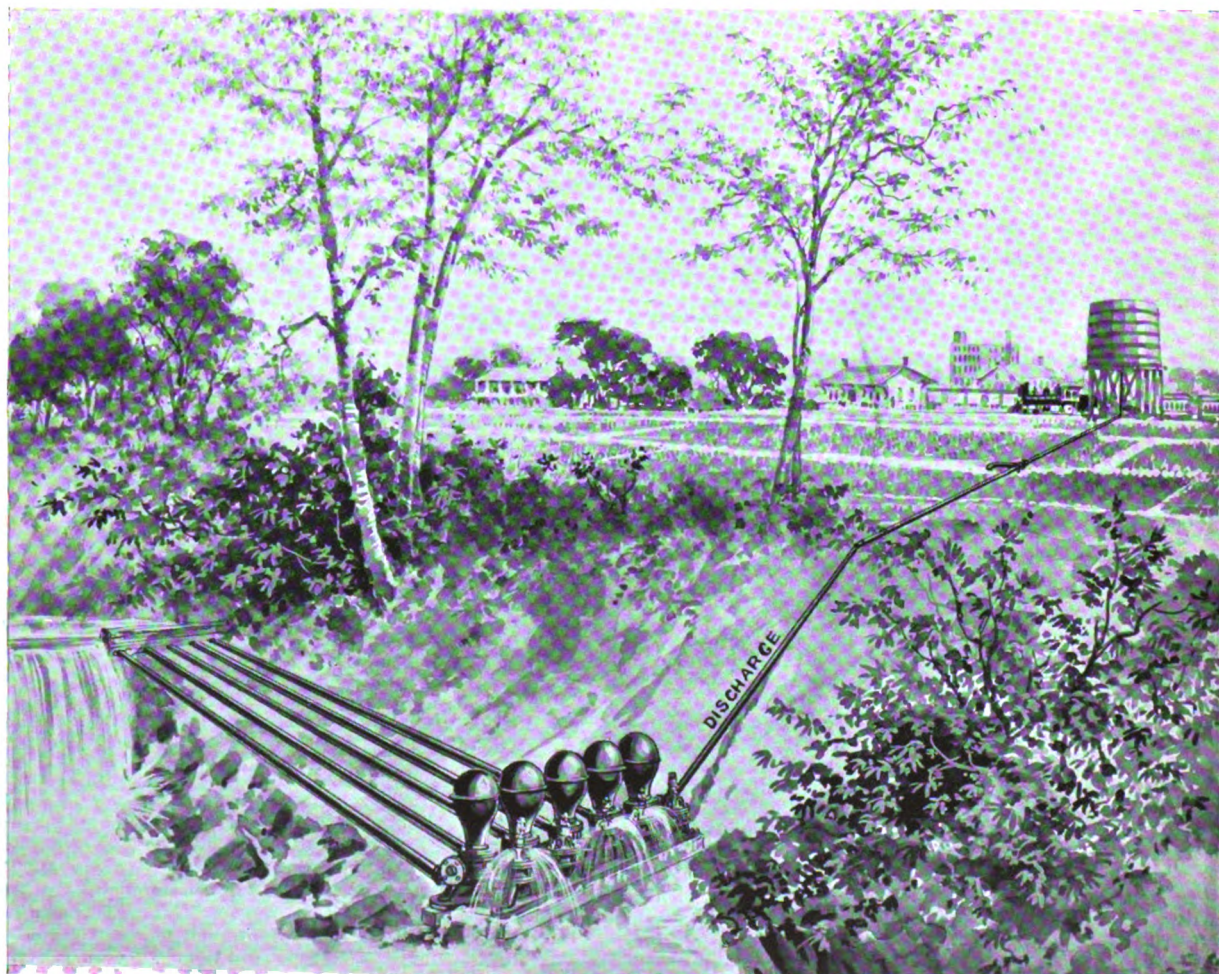
Again, when the requisite quantity of water is forthcoming from the Ram, operating under a certain fall, it is not judicious to increase this, for by so doing the strain on the machine is augmented, those parts doing the labor are over-taxed, and the durability of the Ram lessened.

**SIZE AND LENGTH OF DRIVE PIPE.**—Size of drive pipes has been determined for each size of Ram, after years of experiment and practical use. Do not change it. Practical experience and experiments have proven that the best results are obtained where there is ample, though not excessive, length as well as fall to the drive pipe, for the weight of this volume of water is an important auxiliary in forcing water into the air chamber and through the delivery pipe. We recommend drive pipes to be 50 to 75 feet in length, though in very heavy lifts this may be advantageously increased to 125 and even 200 feet.

Friction of water in pipes will prevent good results, if the Ram with a small drive pipe be placed too far from the water supply; the larger the drive pipe, the longer it can be successfully made. Go by the book.

**WATER FURNISHED RAM.**—The quantity of water furnished a Ram, or amount requisite to operate it, is determined by the size and fall of head of drive pipe, and would refer to our tables giving the contents in gallons or fractions of gallons in pipes and also to our table of tests showing the relative quantities of water forced through drive pipes under different heads. Where the supply of water is limited there is no simpler or better plan of determining this quantity than to measure in pails or barrels the number of gallons which can be led in pipes from the spring or brook per minute, or in any given length of time.

**WATER RAISED AND WASTED.**—The relative height of the spring or supply above the Ram, and the elevation to which it is required to raise, determine the relative proportion between the water raised and wasted—the



BATTERY OF GOULDS RAMS IN OPERATION.

For description and prices, see following pages.

quantity raised varying according to the height it is conveyed with a given fall; also, the distance the water has to be conducted, and consequent length of pipes, have some influence on the quantity delivered at the point of discharge, as the more extended the pipes through which the water has to be forced by the Ram, the more friction there is to be overcome.

A Ram properly set up will easily develop an efficiency of 75% and better. This leads to a simple rule for determining the amount of water delivered from a given supply, viz.: Multiply the number of gallons supplied to the Ram per minute by 3 and this product by the number of feet in head, or fall of drive pipe, and divide by four times the number of feet the water is to be raised. The result is the number of gallons raised per minute.

**EXAMPLE.**—With a supply of ten gallons per minute delivered to Ram, under a head of fall of 10 feet, how much water can be raised to an elevation of 100 feet,  $\frac{10 \times 3 \times 10}{100 \times 4} = .75$  gallon per minute.

**SELECTION OF RAMS.**—Size of Ram to be used can be easily found from tables given in connection with each Ram, after the amount of water that can be depended on for the supply is ascertained, or, where this is in excess of needs, from the delivery required.

Figs. 345 and 345½ represent our single Hydraulic Rams, which can be fitted for wrought-iron or lead pipe, as desired. Figs. 346 and 346½ are for very heavy lifts, as described below, as is also our plan for combining a battery of Rams playing into a single discharge pipe.

**DIRECTIONS FOR PLACING RAMS AND PIPES.**—Do not use smaller discharge pipes than given in our tables, and where length be great it is advisable to increase size. Turns or bends in either drive or discharge pipes should be avoided, if possible. Where obliged to set the Ram with elbows in pipes, make these elbows as large as may be, so as to place as little obstruction to the free and easy flow of water as possible. Same considerations recommend the use of full way gate valves where required.

Ram should always be secured to heavy timbers or masonry and not left dependent merely upon pipe connections. This is important, as there is a constant concussion and strain upon the Ram, and it should be set on foundation as we recommend. Care should be taken to place a suitable strainer over the drive pipe to exclude all rubbish which might choke the pipes or Ram.

In the use of water from deep springs, it is sometimes difficult to keep an adequate supply of air in the air chamber. This can be avoided by drilling a very small hole in the side of the drive pipe near the Ram and inserting a little snifting valve, which we supply as ordered.

**ESTIMATES.**—We are always glad to be consulted on any matters pertaining to Hydraulic Apparatus and will cheerfully make recommendations and prepare estimates, etc., on any plants. To do this, however, we should be definitely advised on the following points: quantity of water which can be supplied to the Ram; quantity of water desired to elevate in any given time; fall or head and distance from spring or brook to desired location of Ram; height to which the water is to be raised.

**BATTERIES OF RAMS.**—We have frequent inquiries for Rams of greater capacity than we build, and to meet this demand offer a combination or battery of any number of Rams playing into a single discharge pipe, as illustrated on opposite page, which possesses some advantages over the largest Rams which it might be practical or profitable to make. In this connection we might say we build the largest Rams of any manufacturer, for the true criterion of capacity is not the nominal number given same but the size of the drive pipe.

Recent practice and tests with our Rams have demonstrated the feasibility of employing Rams under circumstances hitherto considered impractical as, in fact, they are with other Rams than certain types of our own which are specially built for heavy service. Reference to our engravings, Figs. 346 and 346½, will show in a measure how these Rams have been strengthened in all parts, while we can still further increase their efficiency by substituting a new and improved style of brass poppet or spring valve in place of the ordinary leather one in the air chamber, thus rendering them metallic fitted throughout.

Figs. 346 and 346½ are identical in their construction, the Double Ram simply showing a combination of two Rams, while this number can be increased at will.

At the same time, as above stated, these combinations offer certain advantages over Single Rams, for, as each Ram receives its water through a separate drive pipe, the strain is not so great on pipe or Rams as if but one Ram were used, and then, too, in the event of accidents at any time the supply is not suspended, for each of the Rams acts independent of the others.



# GOULDS IMPROVED HYDRAULIC RAMS.

FIG. 345. SIZES, PRICES, ETC.

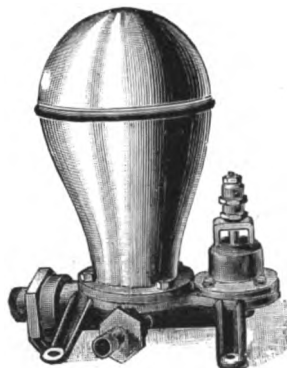


FIG. 345.

Size.	Supply per Minute to Operate Ram.	Length of Drive Pipe, Feet.	PIPES.		Cipher.	* PRICE.
			Drive.	Dis.		Leather Valve.
No. 2	1 to 2 gals.	50 to 75	¾ in.	½ in.	Evade	\$9.00
No. 3	2 to 4 "	50 to 75	1 " "	¾ " "	Evan	11.00
No. 4	3 to 7 "	50 to 100	1 ¼ " "	¾ " "	Event	14.00

FIG. 345½. SIZES, PRICES, ETC.

Size.	Supply per Minute to Operate Ram.	Length of Drive Pipe, Feet.	PIPES.		Cipher.	* PRICE.
			Drive.	Dis.		With Leather Valve.
No. 2	1 to 2 gals.	50 to 75	¾ in.	½ in.	Exabit	\$9.00
No. 3	2 to 4 "	50 to 75	1 " "	¾ " "	Exabon	11.00
No. 4	3 to 7 "	50 to 100	1 ¼ " "	¾ " "	Exabost	14.00
No. 5	6 to 10 "	50 to 150	2 " "	1 " "	Exabub	22.00
No. 6	11 to 25 "	50 to 200	2 ½ " "	1 ½ " "	Fabida	40.00
No. 7	20 to 40 "	50 to 200	3 " "	1 ½ " "	Fabief	75.00
No. 8	25 to 75 "	50 to 200	4 " "	2 " "	Fabift	125.00

\* Leather Valve under Air Chamber.

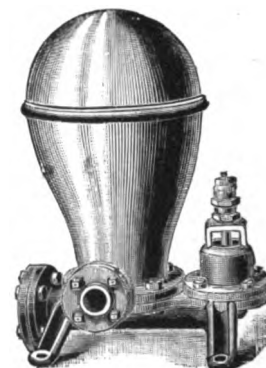


FIG. 345½.

FIG. 346½. SINGLE RAM. SIZES, PRICES, ETC.

Size.	Supply per Minute to Operate Ram.	Length of Drive Pipe, Feet.	PIPES.		Cipher.	PRICE.
			Drive.	Dis.		Brass Spring Valve.
No. 6	11 to 25 gals.	50 to 200	2 ½ in.	1 ½ in.	Exabuck	\$50.00
No. 7	20 to 40 "	50 to 200	3 " "	1 ½ " "	Exabude	85.00
No. 8	25 to 75 "	50 to 200	4 " "	2 " "	Exacat	135.00

FIG. 346. DOUBLE RAM. SIZES, PRICES, ETC.

Size.	Supply per Minute to Operate Ram.	Length of Drive Pipe, Feet.	PIPES.		Cipher.	PRICE.
			Drive.	Dis.		† Brass Spring Valve.
No. 6	11 to 25 gals.	50 to 200	2 ½ in.	1 ½ in.	Exalt	\$100.00
No. 7	20 to 40 "	50 to 200	3 " "	2 " "	Excel	170.00
No. 8	25 to 75 "	50 to 200	4 " "	2 ½ " "	Exert	270.00

† Brass Spring Valve under Air Chamber.

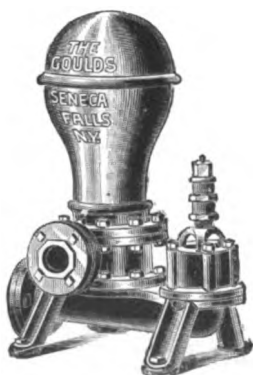


FIG. 346½.

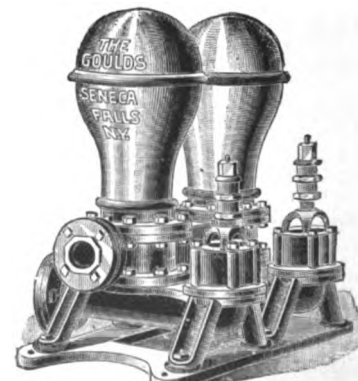
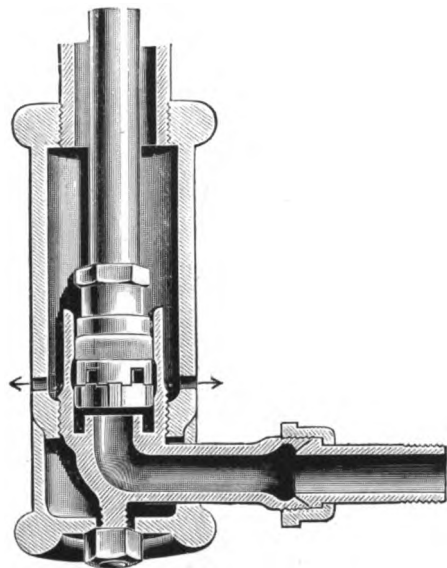


FIG. 346.

Fig. 345 can be fitted for wrought-iron or lead pipe, as ordered; Fig. 345½ for wrought-iron pipe only.

# GOULDS "STAR" AND "CRESCENT" HYDRANT VALVES.



**SECTIONAL VIEW OF "STAR" VALVE.**

We are pleased to submit sectional views of valves used in our "Star" and "Crescent" Hydrants and Street Washers so long and favorable known to the trade. To the left the "Star" valve, and to the right, the "Crescent" valve.

The two are so different in principle and operation that they must be considered separately. Let us take first the "Star." The controlling principles of this Hydrant are the compression valves and movable waterways provided for the outlet of water through  $\frac{1}{2}$ -inch inside pipe—the  $1\frac{1}{2}$ -inch outer pipe acting as a frost case. This inside pipe or waterway, actuated by brass screw and handle above, controls valve and provides direct passage for water to the spout without accessories of packing or washers of any kind at top.

The raising of plunger valve  $\frac{1}{8}$  inch closes the drip-hole before any water enters pipe, and closing same upon its seat allows water to drain immediately into outside chamber, and from thence through several drip-holes into ground, emptying the Hydrant entirely and almost instantly of water.

The area of water openings in plunger valve is equal to that of inlet pipe. To repair the "Star" Hydrants or Washers, remove the Hydrant spout and top cap or Washer plate and withdraw plunger.

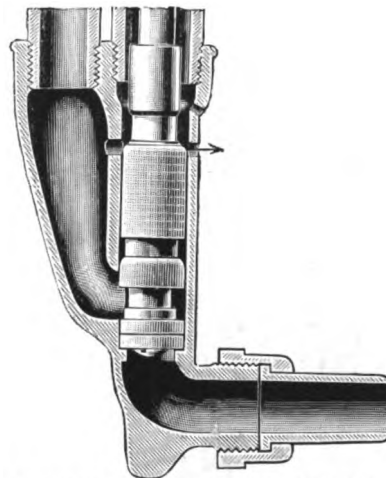
In the "Crescent" Hydrant we have two pipes—one covering valve rod and termed the "dry pipe," and the other conveying water to spout and termed the "wet pipe."

The illustration is so plain and construction so simple as to hardly need explanation. The rod in this Hydrant is actuated by brass screw and handle above and raising plunger the smallest fraction of an inch closes waste before any water can enter discharge pipe. With the valve open we have a full and unobstructed flow of water through Hydrant which can well be compared to a straight-way valve or round-way cock. Closing the valve empties all water from wet pipe through drip-hole.

To repair "Crescent" Hydrant or Washer, remove top cap or plate and withdraw plunger valve.

Our cuts show the position of all cup and washer packings in both valves.

It only remains to be said that every Hydrant and Washer is carefully and thoroughly tested before leaving our works, and we guarantee them free from all defects in material and workmanship. The test of years and public appreciation are the best proof of their merits.



**SECTIONAL VIEW OF "CRESCENT" VALVE.**

# GOULDS "CRESCENT" HYDRANT AND STREET WASHER.

WITH STRAIGHT-WAY VALVE.

The cuts show our new "Crescent" Hydrants and Street Washers with all necessary parts brass, and two pipes—one dry, through which the valve can be withdrawn for repacking, the other forming a passage for the water to the spout.

*They are perfectly anti-freezing. The valve closes against the pressure; the waste is ample and reliable, and no water whatever can enter the dry pipe.*

In our Fig. 860 Hydrant, it will be noticed we have substituted a bolted top cap, permitting the ready removal and withdrawal of plunger valve without trouble; also a heavy, double-threaded brass screw, actuating valve below.

This Hydrant Stock is made in halves, bolted together, and the moldings are nicely gilded, making the Hydrant of great utility and completeness as well as an ornament to the lawn and sidewalk.

Fig. 861 Street Washer has the same valves, pipes, etc., as are used with Hydrant, while either of them can be connected to lead or iron pipe, thus saving the carrying of a stock of each kind.

Figs. 811 and 812 Hydrant and Washer are similar in design and construction to Figs. 860 and 861 just described, but carry larger connecting pipes, heavier valve cases and valves, stock or sides, and are regularly fitted with pipe inlet at bottom.

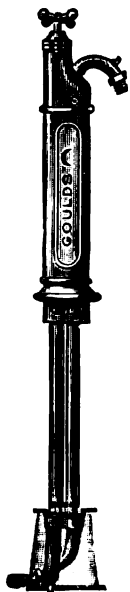


FIG. 860.

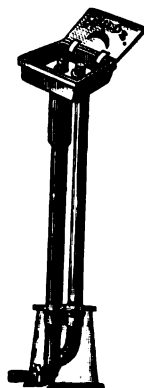


FIG. 861.

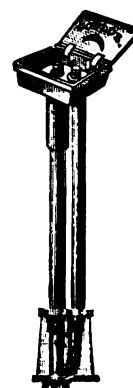


FIG. 812.

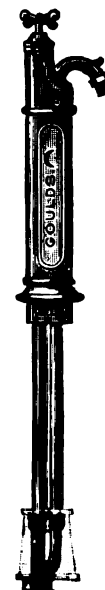


FIG. 811.

Length to Set in Ground.	FIG. 860. ¾-INCH HYDRANT.		FIG. 861. ¾-INCH WASHER.		FIG. 811. ¾-INCH HYDRANT.		FIG. 812. ¾-INCH WASHER.	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
18 in.	Wagein	\$9.80	Wailme	\$6.60	Wagtail	\$11.65	Waitin	\$7.70
24 "	Wagels	10.10	Wainc	6.85	Wahaby	11.95	Waitres	8.00
30 "	Clonged	10.35	Coldiv	7.10	Craftier	12.25	Curbed	8.30
36 "	Wagerd	10.60	Wainag	7.35	Waifer	12.55	Waiv	8.60
42 "	Clubbing	10.80	Colder	7.55	Crustic	12.85	Curiosity	9.00
48 "	Wageat	11.00	Wairn	7.75	Waift	13.15	Waived	9.20
54 "	Wagging	11.25	Craft	8.00	Crustier	13.45	Waiving	9.50
60 "	Waggis	11.50	Waist	8.25	Wailed	13.75	Waivjs	9.80
72 "	Waggie	12.10	Waister	8.85	Wailfa	14.35	Wakel	10.40

Street Washer Keys, \$0.20.



# GOULDS CRESCENT HYDRANTS.

WITH STRAIGHT-WAY VALVE.

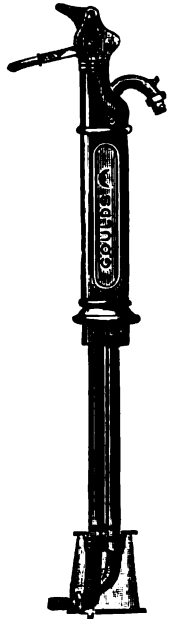


FIG. 1040.

Fig. 1040 represents our "Crescent" Hydrant arranged with lever instead of screw handle. In all other respects it is the same as Fig. 860 shown on opposite page, being perfectly anti-freezing. The flanged top permits the withdrawal of plunger through dry pipe whenever it needs repacking. Wet pipe is  $\frac{1}{2}$ -inch, dry pipe  $\frac{3}{4}$ -inch; inlet for  $\frac{3}{4}$ -inch pipe, outlet for  $\frac{1}{2}$ -inch pipe or  $\frac{3}{4}$ -inch hose.

Fig. 813 Hydrant is same as Fig. 811, on opposite page, stripped of Stock or Sides, making it somewhat lighter and cheaper.

"Crescent" Hydrants and Washers are supplied with removable Sand Cups covering valve case and are regularly fitted  $\frac{3}{4}$ -inch pipe inlet (the male screw on inlet opening of valve case will take a  $\frac{3}{4}$ -inch gas-pipe coupling, when gas pipe is to be connected) and  $\frac{3}{4}$ -inch hose outlet.

Length to Set in Ground.	FIG. 1040. $\frac{3}{4}$ -INCH HYDRANT.		FIG. 813. $\frac{3}{4}$ -INCH HYDRANT.	
	Cipher.	Price.	Cipher.	Price.
18 in.	Drebeha	\$10.75	Curiole	\$8.65
24 "	Drebeij	11.10	Curul	8.95
30 "	Drebeju	11.40	Curveted	9.25
36 "	Drebfal	11.65	Dagger	9.55
42 "	Drebfed	11.85	Damocles	9.85
48 "	Drebfif	12.10	Danced	10.15
54 "	Drebfos	12.35	Dashing	10.45
60 "	Drebfub	12.65	Daystar	10.75
72 "	Drebgoo	13.30	Decayed	11.35

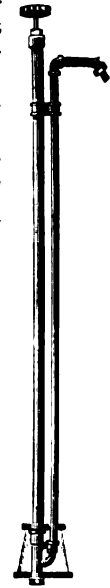


FIG. 813.

## SWIVEL COUPLING.

We illustrate in position our improved Revolving Swivel Coupling. It is self-grinding and by permitting hose to be moved in any position avoids all possibility of kinking and attending breaking after a time.

Revolving Swivel Coupling, $\frac{1}{2}$ -inch Hose	(Wheezyd)	\$1.25
Revolving Swivel Coupling, 1-inch Hose	(Deemed)	2.00

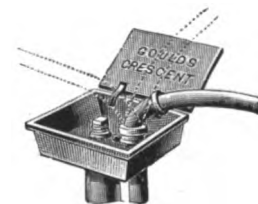


FIG. 943.

# GOULDS "STAR" HYDRANT AND STREET WASHER.

WITH COMPRESSION VALVES AND MOVABLE WATERWAYS.



These goods have been on the market now for several years, and are so familiar to those who have used them, that any description of their superior merits is unnecessary. There is not much opportunity to display constructive taste in a Street Washer, but it is universally conceded that our Hydrant is handsome in design and finish, and is quite an addition to the appearance of a yard or lawn. We have allowed no opportunity to pass to improve both our Hydrants and Washers; and while in general the principle of their mechanism is unchanged, many minor changes and improvements have been made.

*They are perfectly anti-freezing. They are made to set in the ground any depth, from eighteen inches to six feet. They are almost instantly opened or closed by means of the double-threaded brass screw actuating the valve below. They can be repaired from the top without digging up.*

They have a brass swivel or coupling nut (not an iron one), and the tube for service pipe connection is ground to a joint with the valve case elbow. They readily sell for more money than any others, because no others bear any comparison with them. It would always be well to have a short piece of lead pipe between the coupling and service pipe, as its flexibility will prevent a fracture of the pipe when the frost heaves the ground, and in clay soil to make some provision for drainage of waste water, if it be nothing more than a small body of gravel or sand between the bottom attachment and clay. We measure from ground line to centre of service pipe inlet. An Iron Turn Key goes with each Street Washer.



FIG. 647.

FIG. 646. Every Hydrant and Washer is thoroughly tested before leaving our factory.

Our  $\frac{3}{4}$ -inch "Star" Hydrants and Washers are regularly fitted  $\frac{3}{4}$ -inch Pipe Inlet and Hose Outlet. Our 1-inch Hydrants and Washers 1-inch Pipe Inlet and Hose Outlet.

## FIGS. 646 AND 647. SIZES, PRICES, ETC.

Length to set in the Ground.	FIG. 646. $\frac{3}{4}$ -INCH.		FIG. 647. $\frac{3}{4}$ -INCH.		FIG. 646. 1-INCH.		FIG. 647. 1-INCH.	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
18 in.	Veneild	\$9.25	Vengerl	\$7.75	Ventana	\$11.75	Veracit	\$9.25
24 "	Venejan	9.50	Venial	8.00	Venter	12.00	Veranda	9.50
30 "	Veneom	9.75	Venison	8.25	Ventilat	12.25	Verb	9.75
36 "	Venene	10.00	Venoma	8.50	Ventiles	12.50	Verbal	10.00
42 "	Venerat	10.50	Venous	9.00	Venture	13.00	Verbami	10.50
48 "	Venerel	11.00	Ventabc	9.50	Venue	13.50	Verbatu	11.00
54 "	Veney	11.50	Ventage	10.00	Venulos	14.00	Verbiag	11.50
60 "	Venge	12.00	Ventail	10.50	Venus	14.50	Verbosc	12.00
72 "	Vocal	13.00	Vocalix	11.50	Vocalic	15.50	Vocalks	13.00

Street Washer Keys, 20 cents.

# GOULDS "STAR" WALL HYDRANT AND WASHER.

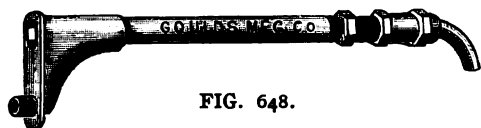


FIG. 648.

Fig. 648 represents our new design Wall Hydrant and Washer with compression valve, made of solid brass, with 1-inch wrought-iron connecting pipe and wrought-iron rod.

This Hydrant can be operated from the outside and opened and closed from the same place.

The connection is effected on the inside by means of a brass swivel or coupling nut and elbow fitted for lead pipe, while the hub on the outside is cut for either  $\frac{3}{4}$  or 1 inch hose coupling, as ordered.

The valve is opened and closed against a brass valve seat by means of a double-threaded brass screw, operated by a key, which we furnish.

FIG. 648. SIZES, PRICES, ETC.

Inlet for Lead Pipe.	Outlet for Hose.	Length.	For Walls.	Cipher.	Price, Brass.
$\frac{3}{4}$ in.	$\frac{3}{4}$ in.	12 in.	9 in.	Gluiop	\$6.00
$\frac{3}{4}$ "	$\frac{3}{4}$ "	16 "	13 "	Gluiud	6.50
$\frac{3}{4}$ "	$\frac{3}{4}$ "	21 "	18 "	Gluiac	7.00
$\frac{3}{4}$ "	$\frac{3}{4}$ "	27 "	24 "	Gluijb	7.50
$\frac{3}{4}$ "	$\frac{3}{4}$ "	33 "	30 "	Gluiol	8.00
$\frac{3}{4}$ "	$\frac{3}{4}$ "	39 "	36 "	Gluiub	8.50

Turn keys, each 20 cents.

## GOULDS ADJUSTABLE CURB BOX.

The cut shows our New Adjustable Curb Box for opening or closing cock in service pipe, as many times becomes necessary in making repairs or changes in the pipes in buildings or in hydrants in yards.

The outside case is made of cast iron and is 22 inches high, while through this can be moved to any desired length the piece of 1-inch pipe enclosing rod. The lower end of this rod is forked in proper shape to take and turn the lever of service or corporation cock and the upper end flattened so it can be operated with such wrenches as plumbers use.

FIG. 649. SIZES, PRICES, ETC.

Size Pipe.	Length Pipe.	Length Rod.	Extreme Length.	Cipher.	Price.
1 in.	42 in.	43 in.	62 in.	Vicar	\$3.00
1 "	52 "	53 "	72 "	Vegat	3.40
1 "	64 "	65 "	84 "	Gluiuca	3.75

Turns, each 50 cents.

## CURB BLOCK.

Fig. 827 shows a very neat and serviceable Curb Block to be used in connection with Fig. 649 Curb Box. The Block measures 7 x 7 inches, with opening to receive cap of Curb Box.

PRICE.

Fig. 827, each . . . . . (Whelk) \$0.60



FIG. 827.

## GOULDS NEW STEEL AMALGAM BELL.

COMPLETE WITH HANGINGS, AS SHOWN IN CUT.



FIG. 758.

Fig. 758 represents our new pattern Steel Amalgam Bell, which we have just perfected, and are prepared to furnish at greatly reduced prices.

We believe they are superior to many more expensive makes and that they will fully sustain the high standard of the "Goulds" Bell, and give the best satisfaction.

They are well adapted to farms, school-houses, factories, or any place where a cheap but serviceable Bell can be used.

FIG. 758. SIZES, PRICES, ETC.

No.	Diameter.	Approx. Weight.	Cipher.	Price.
A 1	15 in.	40 lbs.	Vaporing	\$4.00
A 2	17 "	60 "	Vaporiz	5.00
A 3	19 "	75 "	Vapory	7.50
A 4	21 "	100 "	Varanus	10.00

## GOULDS LARGE STEEL AMALGAM BELL.

WITH HANGINGS AND FRAME.



FIG. 353.

Fig. 353 represents our Steel Amalgam Bell, as we mount them in the larger sizes for churches, school-houses, factories, engine houses, etc. We have sent thousands of these Bells to various portions of the United States, as their cheapness places them in the reach of any church, and they have always given splendid satisfaction.

We send all our Bells to market richly gilded.

We put tolling attachment as shown in cut, on Nos. 6 and 7 at \$4.00 extra, and on No. 8 at \$5.00 extra list.

FIG. 353. SIZES, PRICES, ETC.

No.	Diameter.	Approx. Weight of Bell only.	Approx. Weight Complete.	Size of Frame.	Cipher.	Price.
3	18½ in.	65 lbs.	172 lbs.	27 X 41½ in.	Fabric	\$16.00
4	21 "	80 "	186 "	30 X 41½ "	Fabrile	20.00
5	24 "	134 "	240 "	32½ X 41½ "	Fable	25.00
6	28 "	247 "	396 "	36 X 48 "	Facel	40.00
7	30 "	325 "	487 "	36 X 48 "	Fact	50.00
8	33 "	414 "	689 "	38 X 48 "	Fade	75.00

# GOULDS IMPROVED BURRALL'S IRON CORN SHELLER.

RIGHT-HANDED.

We are the only manufacturers of the genuine Burrall's Corn Sheller, which has for years been conceded the best in the market, and warn the Trade against spurious machines. *It is all iron, and very durable; it shells and separates perfectly clean; it will shell either large or small corn; and its repairs are cheap and easily replaced.*

Get only the Burrall Sheller with our name on, and avoid all trouble.

FIG. 430. SIZE, PRICE, ETC.

	Approximate Weight.	Cipher.	Price.
Corn Sheller, complete	130 lbs.	Flew	\$8.00

We pack one Sheller in a case, or from six to eight in a hoghead.



FIG. 430.

## CORN SHELLER PIECES.

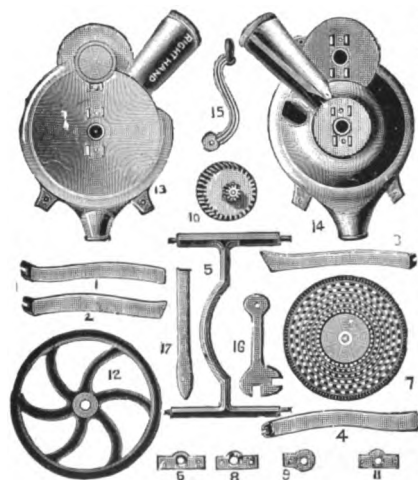


FIG. 431.

No. 6, Shell Wheel Box, flat side	\$0.15
No. 7, Shell Wheel	1.75
No. 8, Shell Wheel Box, round side	.15
No. 9, Feed Wheel Box, flat side	.15
No. 10, Feed Wheel	.80
No. 11, Feed Wheel Box, round side	.15
No. 12, Balance Wheel	1.75
No. 13, Flat Side	2.00
No. 14, Round Side	2.00
No. 15, Handle	.40
No. 16, Wrench	.15
No. 17, Spring	.65

## IRON COLUMN CURB FOR CHAIN PUMPS.

This cut represents our Iron Curb for the Chain Pump. These Curbs are much more durable and substantial than any wood frame, and will be found the best Curb ever designed for this purpose.

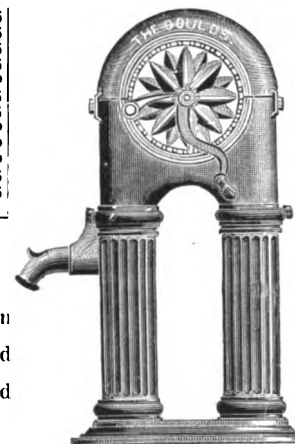


FIG. 347.

FIG. 347. SIZE, PRICE, ETC.

	Approximate Weight.	Cipher.	Price.
Iron Column Curb	102 lbs.	Exile	\$9.00

No. 1, Leg	\$0.35
No. 2, Leg	.35
No. 3, Leg	.35
No. 4, Leg	.35
No. 5, Cross Bar	.60



FIG. 383.

## GOULDS WROUGHT-IRON JACK SCREWS.

WITH IRON STANDS. SWIVEL CAPS.

Diameter of Screw.	Length of Screw.	Thread Cut.	Will Raise.	Cipher.	Price.
1½ in.	11 in.	8 in.	6 in.	Fitch	\$6.00
1¾ "	12 "	9 "	7 "	Fitz	7.00
2 "	15½ "	12 "	9 "	Fiveba	10.00
2½ "	17½ "	14 "	10 "	Fixif	14.00
3 "	20 "	16 "	12 "	Flagol	16.00

## GOULDS CAST-IRON JACK SCREWS.

WITH NUT TO LET INTO WOODEN BLOCK.

FIG. 385. SIZE, PRICE, ETC.



FIG. 385.

Diameter.	Length.	Cipher.	Price.
3 in.	24 in. cast threads.	Finch	\$6.00

## GOULDS WROUGHT-IRON CHEESE AND CIDER PRESS SCREWS.

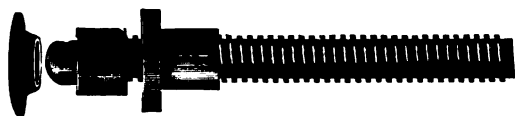


FIG. 386.

Diameter.	Length.	Cipher.	Price.
2¼ in.	36 in.	Peels	\$13.25
2½ "	36 "	Peepap	17.00
2¾ "	42 "	Peerso	18.75
3 "	36 "	Pelts	23.75
3 "	48 "	Pentup	27.50
4 "	48 "	Peonsi	37.50
4 "	60 "	Pert	40.00

Screws of any length or size made to order.

## GOULDS CAST-IRON CIDER PRESS SCREWS.

Diameter.	Length.	Cipher.	Price.
4 inch.	4 feet.	Fiend	\$15.00

## GOULDS WINE OR LARD PRESS SCREWS.



FIG. 379.

Diameter.	Length.	Cipher.	Price.
1½ in.	18 in.	Firm	\$5.75
1¾ "	18 "	Firstmo	6.00
1½ "	24 "	Fish	6.75
2½ "	24 "	Dagloam	12.50

## GOULDS PLUMBERS' SQUARE SINKS.

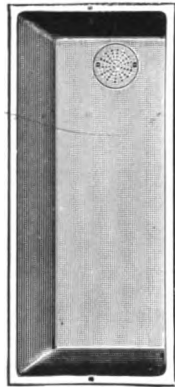
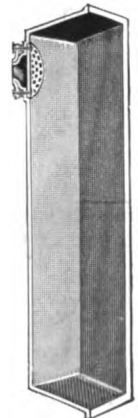


FIG. 428.

Size.	Depth.	Painted.	Galvanized or Gray Enameled.	White Enameled.
12 X 18 in.	6 in.	\$1.25	\$2.60	\$4.75
12 X 20 "	6 "	1.50	. .	. .
13 X 19 "	5 "	1.50	. .	. .
14 X 20 "	6 "	1.50	3.20	6.00
14 X 22 "	6 "	1.60	. .	. .
14 X 24 "	6 "	1.70	. .	. .
15 X 23 "	6 "	1.70	3.40	6.25
16 X 24 "	6 "	1.80	4.00	6.50
15 X 25 "	6 "	1.75	3.60	6.50
15 X 27 "	6 "	2.00	4.25	7.25
16 X 28 "	6 "	2.10	4.50	7.50
16 X 30 "	6 "	2.25	4.75	7.75
17 X 25 "	6 "	2.10	. .	. .
17 X 28 "	6 "	2.20	. .	. .
18 X 24 "	6 "	2.10	4.30	7.00
18 X 30 "	6 "	2.50	5.10	8.50
20 X 30 "	6 "	3.00	6.25	9.00
18 X 32 "	6 "	3.00	6.25	9.50
18 X 36 "	6 "	3.00	6.50	9.50
19 X 38 "	6 "	3.80	8.00	11.00
20 X 36 "	6 "	3.70	7.75	10.50
20 X 40 "	6 "	4.00	8.50	11.50
18 X 42 "	6 "	4.00	8.75	11.75
20 X 42 "	6 "	4.25	9.00	12.00
22 X 42 "	6 "	4.25	9.00	12.00
24 X 48 "	6 "	5.75	12.25	15.00
24 X 50 "	6 "	7.50	16.00	18.00



Sectional  
View.

## GOULDS ADJUSTABLE SINK BRACKETS.

No.	For Sinks.	Painted.	Galvanized.
1	12 to 18 in. wide.	\$0.60	\$1.00
2	18 to 24 "	1.00	1.50

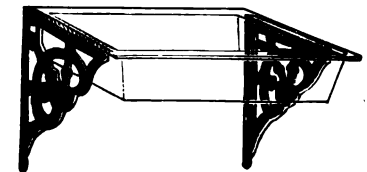


FIG. 814.

## GOULDS ROUND CORNER SINKS.

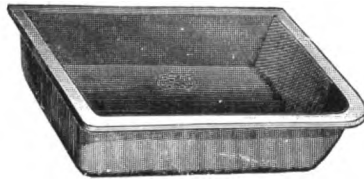
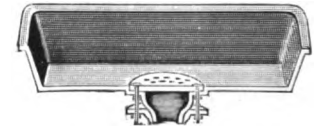


FIG. 415.

Size.	Depth.	Painted.	Galvanized or Gray Enameled.	White Enameled.
16 X 24 in.	5 in.	\$1.70		
16 X 24 "	6 "	1.80	\$4.00	\$6.50
18 X 30 "	6 "	2.50	5.10	8.50



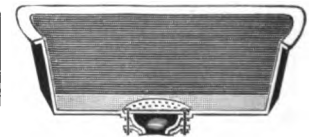
Sectional View.



FIG. 418.

## GOULDS HALF CIRCLE SINKS.

No.	Back.	Width.	Depth.	Painted.	Galvanized or Gray Enameled.	White Enameled.
1	24 in.	14 in.	6 in.	\$1.50	\$3.25	\$6.00
2	27 "	14 "	6 "	1.80	3.90	7.00



Sectional View.



FIG. 429.

## GOULDS CORNER SINKS.

No.	Sides.	Front.	Depth.	Painted.	Galvanized or Gray Enameled.	White Enameled.
1	20 in.	28 in.	6 in.	\$1.75	\$3.50	\$7.00
2	22 "	31 "	6 1/2 "	2.10	4.20	8.00



Sectional View.

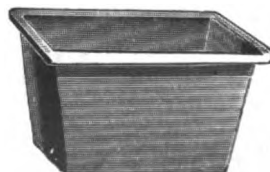
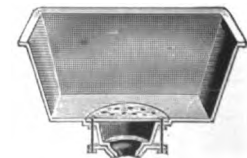


FIG. 419.

## GOULDS SLOP SINKS.

No.	Size.	Depth.	Painted.	Galvanized or Gray Enameled.	White Enameled.
1	16 X 16 in.	10 in.	\$2.70	\$5.25	\$7.50
2	20 X 14 "	12 "	3.50	6.50	8.50
3	24 X 20 "	12 "	5.00	9.50	11.50



Sectional View.

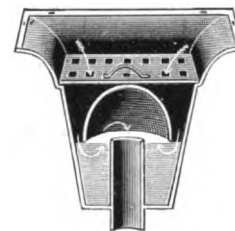


## GOULDS SEWER TRAP.



FIG. 403.

No.	Size.	Depth.	Outlet.	Painted.
1	16 x 16 in.	8 in.	2 in.	\$2.50



Sectional View.

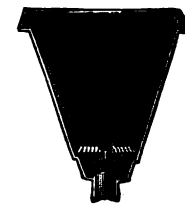
## GOULDS SEWER TRAP AND SLOP SINK.

WITH TRAP AND STRAINER.



FIG. 416.

No.	Size.	Depth.	Outlet.	Painted.
1	12 x 12 in.	6 in.	2 in.	\$1.50
2	15 x 15 "	11 1/2 "	2 "	2.25
3	18 x 18 "	12 "	3 "	3.00
4	20 x 20 "	12 "	3 "	3.50



Sectional View.

## GOULDS IMPROVED HYDRANT CESS POOL.

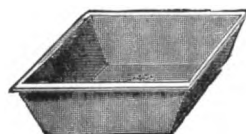


FIG. 420.

No.	Size.	Depth.	Outlet.	Painted.
1	12 x 12 in.	6 in.	5 in.	\$1.00
2	14 x 14 "	6 "	5 "	1.15
3	16 x 16 "	6 "	5 "	1.30



Sectional View.

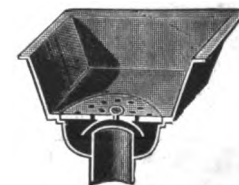
## GOULDS IMPROVED HYDRANT CESS POOL.

WITH BELL TRAP.



FIG. 421.

No.	Size.	Depth.	Outlet.	Painted.
1	12 x 12 in.	6 in.	5 in.	\$1.50
2	14 x 14 "	6 "	5 "	1.65
3	16 x 16 "	6 "	5 "	1.80



Sectional View.

## GOULDS LARGE CESS POOL. WITH BELL TRAP.



FIG. 369.

Size.	Depth.	Outlet.	Painted.
16 X 16 in.	10 in.	4 in.	\$4.50



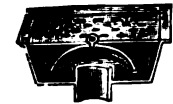
Sectional View.

## GOULDS CELLAR TRAP.



FIG. 417.

No.	Size.	Depth.	Outlet.	Price.
1	9 X 9 in.	2 1/4 in.	2 in.	\$0.75
2	12 X 12 "	2 1/4 "	2 "	1.00



Sectional View.

## SINK STRAINER.



FIG. 435.

Diameter.	Painted.	Galvanized or Gray Enameled.	White Enameled.
4 1/4 in.	\$1.50	\$2.60	\$3.00

## SINK BOLT.

Fig. 368, per dozen . . . . .	\$0.40
" " per 100 . . . . .	2.00
Short Brass Sink Bolts, per dozen . . . . .	.60



FIG. 368.

## OPEN END SINK COUPLING.

FOR LEAD PIPE.



FIG. 434.

Fig. 434, per dozen . . . . .	Painted.	Galvanized.
	\$1.50	\$2.00

## OPEN END SINK COUPLING.

FOR IRON PIPE.

Fig. 366, per dozen . . . . .	Painted.	Galvanized.
	\$9.00	\$10.80



FIG. 366.

# GOULDS FULL WAY BRASS JACKET DRIVE WELL POINT.

FIG. 524. SIZES, PRICES, ETC.



FIG. 524.

Trade No.	Diameter Pipe.	Length of Jacket.	Length of Pipe.	No. of Holes.	No. 60 Gauze per Dozen.	No. 70 Gauze per Dozen.	No. 80 Gauze per Dozen.	No. 90 Gauze per Dozen.	No. 100 Gauze per Dozen.
74	1 in.	18 in.	24 in.	72	\$33.00	\$40.00	\$46.00	\$52.00	\$62.00
76	1 "	24 "	30 "	96	42.00	49.00	56.00	64.00	78.00
78	1 "	30 "	36 "	120	51.00	59.00	65.00	76.00	94.00
80	1 "	36 "	42 "	144	60.00	68.00	76.00	88.00	120.00
82	1 "	42 "	48 "	168	69.00	78.00	86.00	100.00	136.00
84	1 "	48 "	54 "	192	78.00	87.00	96.00	112.00	152.00
86	1 1/4 "	14 "	20 "	80	30.00	36.00	42.00	50.00	64.00
90	1 1/4 "	18 "	24 "	100	36.00	44.00	52.00	60.00	80.00
94	1 1/4 "	24 "	30 "	130	46.00	55.00	64.00	75.00	100.00
98	1 1/4 "	30 "	36 "	165	56.00	66.00	76.00	90.00	120.00
100	1 1/4 "	36 "	42 "	200	66.00	77.00	88.00	105.00	140.00
102	1 1/4 "	42 "	48 "	270	76.00	88.00	100.00	120.00	160.00
106	1 1/4 "	48 "	54 "	260	86.00	99.00	112.00	135.00	180.00
110	1 1/2 "	54 "	60 "	290	96.00	110.00	124.00	150.00	200.00
112	1 1/2 "	60 "	66 "	320	106.00	121.00	136.00	165.00	220.00
114	1 1/2 "	66 "	72 "	350	116.00	132.00	148.00	180.00	240.00
136	1 1/2 "	18 "	24 "	120	48.00	57.00	65.00	78.00	94.00
140	1 1/2 "	24 "	30 "	162	60.00	70.00	80.00	96.00	118.00
144	1 1/2 "	30 "	36 "	198	72.00	84.00	95.00	114.00	142.00
146	1 1/2 "	36 "	42 "	240	84.00	97.00	110.00	132.00	166.00
148	1 1/2 "	42 "	48 "	276	96.00	111.00	125.00	150.00	188.00
150	1 1/2 "	48 "	54 "	312	108.00	124.00	140.00	168.00	204.00
152	1 1/2 "	54 "	60 "	348	120.00	138.00	155.00	186.00	228.00
154	1 1/2 "	60 "	66 "	384	132.00	151.00	170.00	204.00	252.00
156	1 1/2 "	66 "	72 "	420	144.00	165.00	185.00	222.00	276.00
160	2 "	18 "	24 "	144	75.00	85.00	94.00	110.00	130.00
164	2 "	24 "	30 "	208	90.00	101.00	112.00	132.00	160.00
168	2 "	30 "	36 "	264	105.00	118.00	130.00	154.00	190.00
170	2 "	36 "	42 "	288	120.00	134.00	148.00	176.00	220.00
172	2 "	42 "	48 "	336	135.00	151.00	166.00	198.00	250.00
174	2 "	48 "	54 "	384	150.00	167.00	184.00	220.00	280.00
176	2 "	54 "	60 "	432	165.00	184.00	202.00	242.00	310.00
178	2 "	60 "	66 "	480	180.00	200.00	220.00	264.00	340.00
180	2 "	66 "	72 "	528	195.00	217.00	238.00	286.00	370.00
184	2 1/2 "	30 "	36 "	300	180.00	205.00	230.00	260.00	300.00
188	2 1/2 "	42 "	48 "	360	230.00	265.00	300.00	340.00	400.00
192	2 1/2 "	54 "	60 "	420	280.00	325.00	370.00	420.00	500.00
196	2 1/2 "	66 "	72 "	480	330.00	385.00	440.00	500.00	600.00
200	3 "	30 "	36 "	300	240.00	275.00	310.00	340.00	410.00
204	3 "	42 "	48 "	420	300.00	345.00	390.00	430.00	520.00
208	3 "	54 "	60 "	540	360.00	415.00	470.00	520.00	630.00
212	3 "	66 "	72 "	660	420.00	485.00	550.00	610.00	740.00
216	4 "	36 "	48 "	360	480.00	520.00	560.00	600.00	700.00
220	4 "	60 "	72 "	600	630.00	695.00	760.00	840.00	1000.00
224	4 "	84 "	96 "	840	780.00	870.00	960.00	1080.00	1300.00
228	4 "	108 "	120 "	1080	930.00	1045.00	1160.00	1320.00	1600.00



Constructive view.

# GOULDS FLUSH OR TUBULAR WELL POINTS.

FIG. 662. SIZES, PRICES, ETC.

Trade No.	Dia. Pipe.	Length of Jacket.	Length of Pipe.	No. of Holes.	No. 60 Gauze, per Dozen.	No. 70 Gauze, per Dozen.	No. 80 Gauze, per Dozen.	No. 90 Gauze, per Dozen.	No. 100 Gauze, per Dozen.
73	1 in.	18 in.	30 in.	72	\$34.00	\$40.00	\$45.00	\$50.00	\$55.00
75	1 "	18 "	36 "	72	38.00	44.00	50.00	56.00	66.00
75½	1 "	24 "	36 "	96	43.00	49.00	55.00	62.00	77.00
77	1 "	24 "	42 "	96	47.00	54.00	60.00	68.00	82.00
77½	1 "	30 "	42 "	120	52.00	59.00	65.00	74.00	93.00
79	1 "	30 "	48 "	120	56.00	63.00	70.00	80.00	98.00
79½	1 "	36 "	48 "	144	61.00	68.00	75.00	86.00	109.00
81	1 "	36 "	54 "	144	65.00	73.00	80.00	92.00	114.00
81½	1 "	42 "	54 "	144	70.00	78.00	85.00	98.00	125.00
83	1 "	42 "	60 "	168	74.00	82.00	90.00	104.00	130.00
116	1½ "	18 "	24 "	100	36.00	44.00	52.00	60.00	80.00
117	1½ "	18 "	30 "	100	41.00	49.00	57.00	65.00	85.00
117½	1½ "	24 "	30 "	130	46.00	55.00	64.00	75.00	100.00
118	1½ "	24 "	36 "	130	51.00	60.00	68.00	80.00	105.00
119	1½ "	24 "	42 "	130	56.00	65.00	73.00	85.00	110.00
120	1½ "	24 "	48 "	130	61.00	70.00	78.00	90.00	115.00
121	1½ "	30 "	36 "	165	56.00	66.00	76.00	90.00	120.00
122	1½ "	30 "	42 "	165	61.00	71.00	80.00	95.00	125.00
123	1½ "	30 "	48 "	165	66.00	76.00	85.00	100.00	130.00
124	1½ "	30 "	54 "	165	71.00	81.00	91.00	105.00	135.00
125	1½ "	36 "	42 "	200	66.00	77.00	88.00	105.00	140.00
126	1½ "	36 "	48 "	200	71.00	82.00	92.00	110.00	145.00
127	1½ "	36 "	54 "	200	76.00	87.00	97.00	115.00	150.00
128	1½ "	36 "	60 "	200	81.00	92.00	102.00	120.00	155.00
130	1½ "	42 "	54 "	230	81.00	92.00	104.00	125.00	165.00
130½	1½ "	42 "	60 "	230	86.00	98.00	110.00	130.00	170.00
131	1½ "	42 "	66 "	230	91.00	103.00	115.00	135.00	175.00
132	1½ "	48 "	60 "	260	91.00	104.00	116.00	140.00	180.00
133	1½ "	48 "	66 "	260	96.00	109.00	122.00	145.00	185.00
135	1½ "	48 "	72 "	260	101.00	114.00	127.00	150.00	190.00

## OPEN END OR WELL POINT EXTENSIONS.

FIG. 662.

FIG. 524½. SIZES, PRICES, ETC.

95	1½ in.	24 in.	30 in.	126	\$46.00	\$55.00	\$64.00	\$75.00	\$100.00
99	1½ "	30 "	36 "	165	56.00	66.00	76.00	90.00	120.00
101	1½ "	36 "	42 "	200	66.00	77.00	88.00	105.00	140.00
145	1½ "	30 "	36 "	198	72.00	84.00	95.00	114.00	142.00
147	1½ "	36 "	42 "	240	84.00	97.00	110.00	132.00	166.00
169	2 "	36 "	36 "	250	105.00	118.00	130.00	154.00	190.00
171	2 "	36 "	42 "	288	120.00	134.00	148.00	176.00	220.00
173	2 "	42 "	48 "	300	135.00	151.00	166.00	198.00	250.00

FIG.  
524½.

# BRASS JACKET "PERFECTION" DRIVE WELL POINTS.

FIG. 138. SIZES, PRICES, ETC.

Trade No.	Dia. Pipe.	Length of Jacket.	Length of Pipe.	Number of Openings.	No. 60 Gauze, per Dozen.	No. 70 Gauze, per Dozen.	No. 80 Gauze, per Dozen.	No. 90 Gauze, per Dozen.	No. 100 Gauze, per Dozen.
5	1 in.	18 in.	24 in.	156	\$33.00	\$40.00	\$46.00	\$52.00	\$62.00
10	1 " "	30 "	36 "	260	51.00	59.00	66.00	76.00	94.00
15	1 1/4 "	14 "	20 "	116	30.00	36.00	42.00	50.00	64.00
20	1 1/4 "	18 "	24 "	152	36.00	44.00	52.00	60.00	80.00
25	1 1/2 "	24 "	30 "	204	46.00	55.00	64.00	75.00	100.00
27	1 1/2 "	30 "	36 "	272	56.00	66.00	76.00	90.00	120.00
28	1 1/2 "	36 "	42 "	316	66.00	77.00	88.00	105.00	140.00
30	1 1/2 "	18 "	24 "	156	48.00	57.00	65.00	78.00	94.00
35	1 1/2 "	24 "	30 "	208	60.00	70.00	80.00	96.00	118.00
40	1 1/2 "	30 "	36 "	260	72.00	84.00	95.00	114.00	142.00
45	2 "	18 "	24 "	152	75.00	85.00	94.00	110.00	130.00
50	2 "	24 "	30 "	200	90.00	101.00	112.00	132.00	160.00
55	2 "	30 "	36 "	248	105.00	118.00	130.00	154.00	190.00

## "PERFECTION" TUBULAR WELL POINTS.

FIG. 139. SIZES, PRICES, ETC.

60	1 1/4 in.	24 in.	28 in.	204	\$46.00	\$55.00	\$64.00	\$75.00	\$100.00
65	1 1/4 "	24 "	42 "	200	56.00	65.00	73.00	85.00	105.00
70	1 1/4 "	30 "	42 "	225	61.00	71.00	80.00	95.00	120.00

# BRASS JACKET "BANNER" DRIVE WELL POINTS.

FIG. 140. SIZES, PRICES, ETC.

Trade No.	Dia. Pipe.	Length of Jacket.	Length of Pipe.	Number of Holes.	No. 60 Gauze, per Dozen.	No. 70 Gauze, per Dozen.	No. 80 Gauze, per Dozen.	No. 90 Gauze, per Dozen.	No. 100 Gauze, per Dozen.
186	1 1/4 in.	14 in.	20 in.	72	\$30.00	\$36.00	\$42.00	\$50.00	\$64.00
190	1 1/4 "	18 "	24 "	90	36.00	44.00	52.00	60.00	80.00
194	1 1/4 "	24 "	30 "	126	46.00	55.00	64.00	75.00	100.00
198	1 1/4 "	30 "	36 "	156	56.00	66.00	76.00	90.00	120.00
336	1 1/2 "	18 "	24 "	118	48.00	57.00	65.00	78.00	94.00
340	1 1/2 "	24 "	30 "	150	60.00	70.00	80.00	96.00	118.00
344	1 1/2 "	30 "	36 "	192	72.00	84.00	95.00	114.00	142.00
350	2 "	18 "	24 "	120	75.00	85.00	94.00	110.00	130.00
354	2 "	24 "	30 "	162	90.00	101.00	112.00	132.00	160.00
358	2 "	30 "	36 "	204	105.00	118.00	130.00	154.00	190.00

FIG. 138.

FIG. 139.

FIG. 661.

**FIG. 66I.**

[illegible]

**FIG. 141. SIZES, PRICES, ETC.**

**Extra charge for finer Gauze. For list on 4-inch or smaller diameter pipe, see Brass Jacket Points.**

**We make this any width up to sixteen inches. Write for samples and prices.**

We have constantly in stock the following number of meshes to the inch: 50, 60, 70, 80, 90 and 100. Write for samples and prices.

# GOULDS TUBULAR WELL CYLINDERS, ETC.

Fig. 142. Brass Tubular Well Cylinder, can be used in rough pipe after the well is made, using the Seating Tool attached to drill rod to crowd it down to its place.

FIG. 142. SIZES, PRICES, ETC.

2	inch, with Valves, per set	.....	\$5.50, with Spring Coupling.
2½	" " " "	.....	11.00, " " "
3	" " " "	.....	16.00, " " "

## ARTESIAN WELL CYLINDER.

The engraving, Fig. 143, represents our steel-cased, brass-lined Artesian Well Cylinder; can be used inside of cased or open wells. The check valve is seated on a shoulder in the special coupling at lower end of Cylinder as shown in the engraving. A 36-inch Cylinder will give a 24-inch stroke.

FIG. 143. SIZES, PRICES, ETC.

Price of Cylinder Only.			Price of Cylinder with Four Leather Valves.		
2	in. X 3 ft., each	..... \$8.00	2	in. X 3 ft., each	..... \$10.50
2½	" X 3 " "	..... 11.00	2½	" X 3 " "	..... 17.00
3	" X 3 " "	..... 15.00	3	" X 3 " "	..... 23.00
4	" X 3 " "	..... 20.00	4	" X 3 " "	..... 36.00

## TUBULAR WELL CYLINDER.

Fig. 728, represented by the engraving, is a regular, polished iron cylinder, made from extra heavy pipe bored out. Prices do not include Points or Valves.

FIG. 728. SIZES, PRICES, ETC.

	3 Feet.	4 Feet.		3 Feet.	4 Feet.
2 in. Black	\$3.00	\$3.50	2 in. Galvanized	\$3.50	\$4.00
2½ " "	5.00	6.00	2½ " "	5.50	6.50
3 " "	7.00	8.00	3 " "	7.50	8.50

Fig. 144 is a vertical section of a steel-cased, brass-lined, Tubular Well Cylinder. It is tinned inside and out.

FIG. 144. SIZES, PRICES, ETC.

2	in. X 3 ft., with shoes only	.....	\$6.00
2½	" X 3 " "	.....	8.00
3	" X 3 " "	.....	10.00
2	" X 3 " complete with valves and points	.....	10.00
2½	" X 3 " "	.....	15.00
3	" X 3 " "	.....	19.00



FIG. 142.

FIG. 143.



FIG. 728.

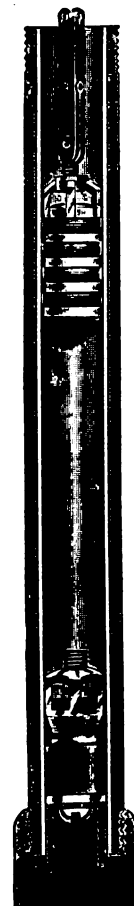
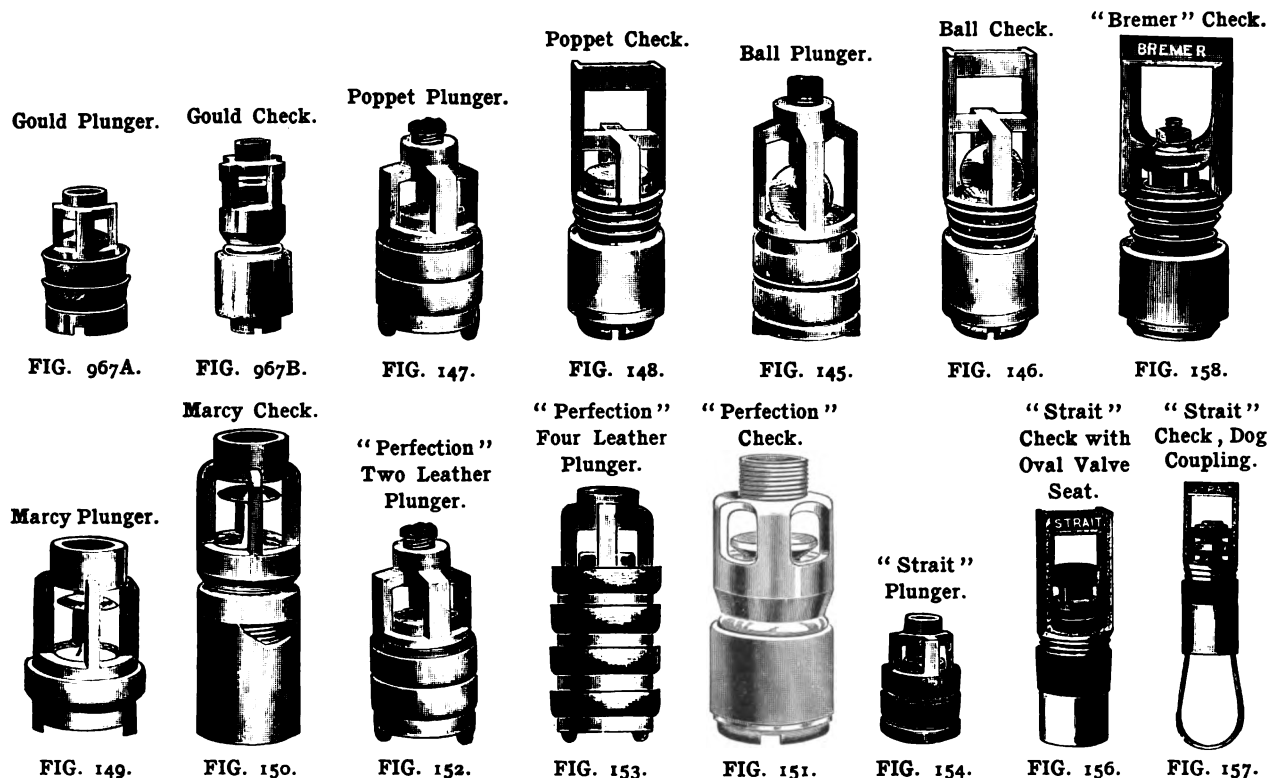


FIG. 144.

# IMPROVED TUBULAR WELL VALVES.



## TUBULAR WELL VALVES. SIZES AND PRICES.

PLUNGERS ONLY.					CHECKS ONLY.					CHECK AND PLUNGER VALVES COMPLETE.				
2	in.	X 2	Leather	\$1.50	2	inch	.	.	\$1.50	2	in.	X 2	Leather	\$3.00
2½	"	X 2	"	3.75	2½	"	.	.	3.75	2½	"	X 2	"	7.50
3	"	X 2	"	5.25	3	"	.	.	5.25	3	"	X 2	"	10.50
2	"	X 4	"	2.25	4	"	.	.	10.50	2	"	X 4	"	3.75
2½	"	X 4	"	5.25	.	.	.	.	.	2½	"	X 4	"	12.00
3	"	X 4	"	6.75	.	.	.	.	.	3	"	X 4	"	24.00
4	"	X 4	"	13.50	.	.	.	.	.	4	"	X 4	"	



# GOULDS TUBULAR WELL SUPPLIES.

## TURNED COUPLING.



FIG. 160.

1 1/4 in. for 2 in. Cylinder	.20 each.
1 1/4 x 1 1/2 " 2 1/2 " "	.40 "
1 1/4 x 2 " 3 " "	.60 "

## SPECIAL TOOL COUPLING.

Made long and heavy, to attach drills and other well making tools to working rods.

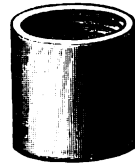
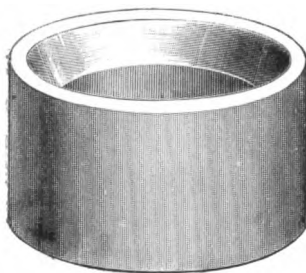


FIG. 161.

1 x 2 1/2 in. long for 1 in. Tool Shanks	\$26.00 net, per 100
1 1/4 x 2 1/4 " " 1 1/4 " "	32.00 " "
1 1/4 x 3 " " 1 1/2 " "	40.00 " "
2 x 3 " " 2 " "	50.00 " "

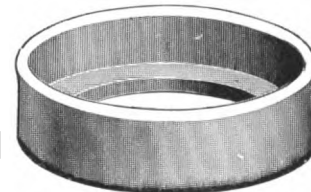


## TUBULAR WELL VALVE, RUBBER.

For 2 in. Valves	.16 each.
" 2 1/2 " "	.30 "
" 3 " "	.40 "
" 4 " "	.60 "

## TUBULAR WELL VALVE, LEATHER.

For 2 in. Valves	.15 each.
" 2 1/2 " "	.15 "
" 3 " "	.25 "
" 4 " "	.45 "



## TUBULAR WELL CYLINDER SHOE.

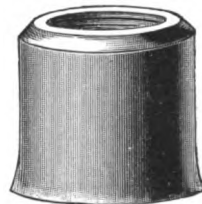


FIG. 16.

2 in. with shoulder	. \$0.70
2 " no " "	1.70
2 1/2 " " "	1.00
3 " " "	1.20
4 " " "	1.50

## COPPER TANK FLOAT.

Can be bolted to a lever attached to Tank Valve to open and close automatically.



FIG. 159.

No. 4, 12 x 3 inches	\$1.50 each.
" 6, 9 1/2 x 2 1/4 "	1.10 "

## BRASS SAND BUCKET OR PUMP.

### FIG. 33. Price List.

Fitted for 1/2 in. gas pipe, for 1 1/4 in. Drive Well Point, net	\$2.50
Fitted for 1/2 in. gas pipe, for 1 1/4 in. Drive Well Point, net	3.50



FIG. 33.

# GOULDS PADDY AND EXPANSION DRILLS

To be used for drilling in Wells to enable the pipe to follow the drill. Paddy Drills are opened by the force of the blow and the earth is pried loose after the point is driven into the ground and the handle lifted. **Female Paddy, Shown Open for Boring.**

Paddy Closed.



FIG. 164.

Paddy Expanded.

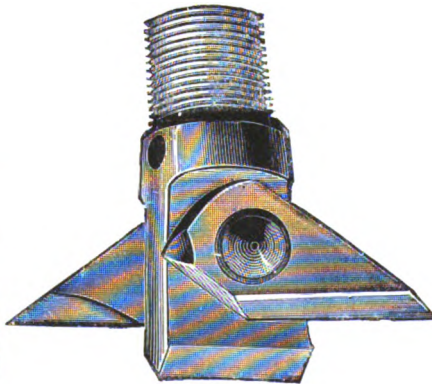


FIG. 164.

## THE "GOPHER."

PATENTED.



FIG. 166. Open.

See opposite page for sizes and prices.

Female Paddy.



FIG. 165.

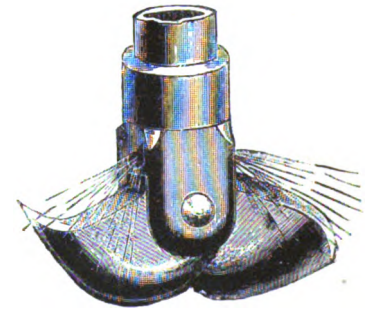


FIG. 165 1/2.



FIG. 167.

Fig. 167, made for jumping or revolving. The wings are opened and held open by the weight of the drill rods.



FIG. 168.

Fig. 168 has removable drill blades, by turning the coupling to bring the hole opposite to the rivet. Its blades are held open by the weight of the drill rods.

the rivet out to remove the drill blades. This is turned to take

# GOULDS PADDY AND EXPANSION DRILLS.

## PRICE LIST.

Size of pipe it will go down, in inches	2	2½	3	3½	4	4½	5	6	7	8	9	10	11	12	13	14	15
Size of hole it will drill	3	4½	5	5½	6½	7	7½	8	9	11	12	13	14	15	17	18	19
Price Paddy, Fig. 164, Female Paddy, Fig. 165, Jumping Drills	\$5.00	\$6.50	\$8.50	\$10.00	\$11.00	\$13.00	\$15.00	\$25.00	\$32.00	\$40.00	\$60.00	\$75.00	\$90.00	\$100.00	\$110.00	\$125.00	\$150.00
Price Fig. 165½, Rotary Paddy Drill: expands by pressing down, makes hole by being revolved on Boring Rod when used with our Revolving Machinery, as illustrated in Revolving Dept.	5.00	6.50	8.50	10.00	11.00	13.00	15.00	25.00	32.00	40.00	60.00	75.00	90.00	100.00	110.00	125.00	150.00
Price Fig. 167, Force Expansion Paddy	6.00	7.80	10.00	12.00	17.20	18.00	20.00	35.00	50.00	75.00	97.00	120.00	145.00	172.00	200.00	235.00	270.00
Price Fig. 168 is Fig. 167 cased			12.00	14.40	20.00	22.00	24.00	42.00	60.00	90.00	117.00	144.00	175.00	207.00	240.00	280.00	325.00
Price Fig. 168, with shoulder drill blades, to be rotated with well casing resting upon them			12.00	15.10	21.00	23.10	25.20	44.00	63.00	94.50	123.00	151.00	184.00	217.00	252.00	294.00	341.00
Price Wings for Fig. 164 or 165, Male or Female Paddies	1.50	2.25	2.75	3.25	3.75	4.65	5.50	7.00	8.00	9.00	12.00	15.00	18.00	22.00	25.00	30.00	34.00
Price Wings for Fig. 165½, Rotary Expansion Drill	1.65	2.50	3.00	3.60	4.10	5.10	6.00	7.75	8.80	10.00	13.25	16.50	20.00	24.00	27.50	33.00	37.50
Price Wings for Fig. 167, plain for jumping	1.65	2.50	3.00	3.60	4.10	5.10	6.00	7.75	8.80	10.00	13.25	16.50	20.00	24.00	27.50	33.00	37.50
Price Wings for Figs. 167 and 168, for boring	1.80	2.75	3.30	4.00	4.50	5.60	6.60	8.50	9.70	11.00	14.60	18.00	22.00	26.50	30.25	36.00	42.00
Price Saw Tooth Drill Blades for Fig. 167, for jumping	1.80	2.75	3.30	4.00	4.50	5.60	6.60	8.50	9.70	11.00	14.60	18.00	22.00	26.50	30.25	36.00	42.00
Price Steel Rivets for either figure	.25	.30	.35	.50	.50	.60	.75	1.00	1.10	1.25	1.60	2.00	2.40	3.00	3.50	4.00	4.50

Intermediate sizes will be charged at the price for next larger size.

## FIG. 166. "GOPHER" DRILL. PRICE LIST.

		Steel Wings.	Rivets — Soft Steel.
Gopher Drill to work through 2-inch pipe, makes a 3-inch hole . . . . .	\$5.00	\$1.50	\$0.25
Gopher Drill to work through 3-inch pipe, makes a 4½-inch hole . . . . .	8.50	2.75	.35

See opposite page for illustrations.

# GOULDS HYDRAULIC AND JETTING DRILLS.



FIG. 169.



FIG. 170.



FIG. 171.



FIG. 172.



FIG. 173.

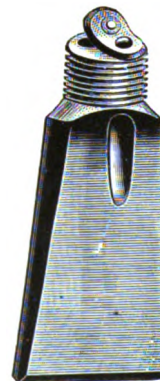


FIG. 174.

Fig. 169 is made of solid steel and is very strong.

These drills are named after size of pipe they pass through; thus a 2-inch drill will work through a 2-inch pipe. 4½-inch and 6-inch drills when used for the jetting process are threaded for 2-inch pipe coupling, but unless specially ordered for jetting purposes are threaded for 1½-inch.

	2-inch.	2½-inch.	3-inch.	4½-inch.	6-inch.
Fig. 170, Twist Drill, for ball or bolt valve . . .	\$4.00	\$5.00	\$6.00	\$9.00	\$12.00
" 171, Chisel Drill, for ball or bolt valve . . .	4.00	5.00	6.00	9.00	12.00
" 169, Round Drill, for ball or bolt valve . . .	5.00	6.00	7.00	12.00	18.00
" 173, Twist Drill, with leather valve . . .	4.50	5.50	6.60	10.00	13.00
" 174, Chisel Drill, with leather valve . . .	4.50	5.50	6.60	10.00	13.00
" 172, Hydraulic Z Drill . . .	6.00	7.00	8.00	12.00	14.00
" 175, Enlarging Drill . . .	6.00	. . .	8.50	10.00	20.00



FIG. 175.



FIG. 729.

## SAND PUMP AND DRILL COMBINED.

### FIG. 729. PRICE LIST.

Gas Pipe Thread Connection.	Actual Size of Bit.	Price.
1 inch . . . . .	1¼ inches.	\$1.25
1 inch . . . . .	2 "	2.00
1 inch . . . . .	2½ "	4.50
1½ inch . . . . .	3 "	6.50

Fig. 219, Sand Catcher, 1¼ inch, each . . . . . \$2.00

Sand Catcher



FIG. 219.

# GOULDS TUBULAR WELL SUPPLIES.

### Sand and Clay Auger.

### Clay Auger.

### Earth and Sand boring Auger.

### Clay and Cobble- stone Auger.

**Auger Head for driving  
and turning Auger when  
starting a hole.**

**Pipe Drifts for cleaning out  
inside of pipe.**



**FIG. 13.**



FIG. 15.



**FIG. 32.**



**FIG. 176.**

**Augers are measured by their outside diameter.**



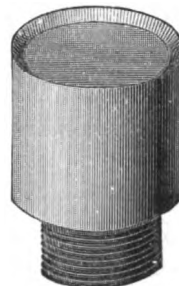
**FIG. 177.**

For 1	in. Auger Rod .	\$2.00
" 1 1/2 "	" "	3.00

**Taper Tap.    Taper Die.**



**FIG. 179.      FIG. 180.**

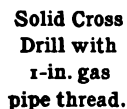


**FIG. 184.**



FIG. 22.

Fig. 184 for 2 in. pipe . . .	\$4.00
Fig. 22 for 2 in. pipe . . .	2.25
Fig. 22 " 2 1/2 " . . .	3.00
Fig. 22 " 3 " . . .	5.00



**FIG. 178.**

2 in. makes a hole for 1 1/4 and 1 1/2 in. pipe	\$5.00
3 " " " 2 " "	7.00
4 " " " 3 " "	10.00
6 " " " 4 1/2 or 5 " "	25.00

**We make Augers to go inside 2-inch pipe when ordered.**



**FIG. 179.      FIG. 180.**

To pull	1 in. or 1 1/4 in. pipe.	2 in.
Tap	\$6.00	\$7.00
Die	8.00	8.00

2 in. \$7.50

# GOULDS TUBULAR WELL SUPPLIES.



FIG. 182.

## DRIVE BLOCKS.

Used to drive Pipe.

FIGS. 182 and 183.

Solid blocks used with the

Hydraulic Tools . . . \$20.00

Hollow blocks used with

the Jetting Tools . . . 30.00

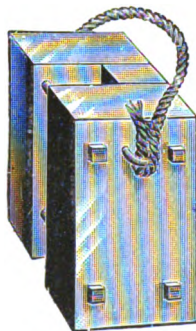


FIG. 183.

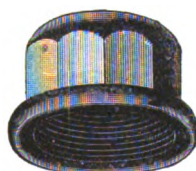


FIG. 510.

## Malleable Drive Cap.

For 1½ in. pipe, 40c. each  
 " 1½ " 50c. "  
 " 2 " 70c. "

## DRIVE PLATE.

Used on top of Pipe to receive the blows of the Drive Block.

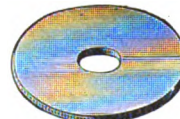


FIG. 185.

No. 1, for 2 and 3 in. pipe-hole, for 1 in. rods \$3.00  
 No. 2, for 3 and 4½ in. pipe-hole, for 1½ in. rods 5.00  
 No. 3, for 4½ and 6 in. pipe-hole, for 1½ in. rods 10.00

Special sizes to order.

## STEEL DRIVE HEADS—Solid.

For 1¼ inch pipe . . . \$3.00  
 " 1½ " . . . 4.50  
 " 2 " . . . 6.00  
 " 2½ " . . . 8.00  
 " 3 " . . . 12.00



FIG. 181.



TUBULAR WELL JAR.

FIG. 186.

## STEEL SHOES.

The 2, 2½ and 3-inch Cast-Steel Shoes are made *open* and *close*. The open Steel Shoe is almost 2 inches inside diameter; the close has a shoulder inside to set the strainer on; this shoulder reduces the inside diameter to little less than 1¾. When ordering Steel Shoes, please state whether open or close Shoes are wanted. Unless otherwise ordered, we always send the open Western Shoe.

Size Pipe Connects to	
¾ in.	\$4.00
1 " 1½ "	5.00
1½ " 2 "	6.00
2 " 2½ "	7.00

## EASTERN SHOE.



FIG. 187.

	2 Inch.	2½ Inch.	3 and 3½ Inch.	4 and 4½ Inch.	5, 5½, 6 and 6½ Inch.	7 Inch.
Cast Steel .	\$2.50	\$3.00	\$4.00	\$10.00	\$12.00	\$15.00
Wrought Steel	6.00	8.00	8.00			

Larger sizes, prices on application.

## WESTERN SHOE.



FIG. 188.

# GOULDS TUBULAR WELL SUPPLIES.

Rope Swivel. Water Swivel. Casing Swivel. Improved Casing Swivel.

Blind or Check Valves.

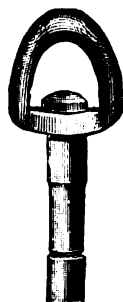


FIG. 11.



FIG. 189.



FIG. 25.



FIG. 190.



FIG. 191.

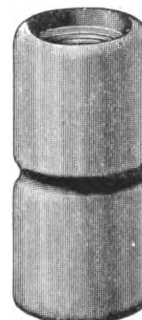
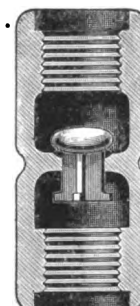


FIG. 192.



Sec. View.

Hydraulic and Jetting Swivel.

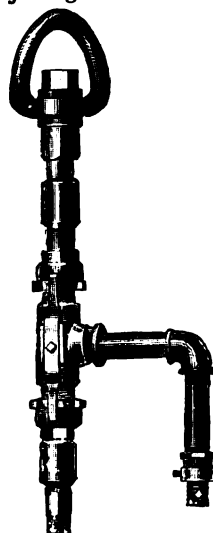


FIG. 194.

## PRICE LIST.

<b>FIG. 11.</b> For 1 in. pipe . . \$2.00 " 1 " heavy, 4.00 " 1¼ " " 8.00		<b>FIG. 189.</b> For 1 in. pipe . . \$20.00 " 1¼ " " 25.00		<b>FIG. 25.</b> To fit 2 in. casing \$4.00 " 2½ " 5.00 " 3 " 7.00 " 4 " 8.00 " 4½ " 8.50 " 5 " 10.00 " 6 " 12.00 " 7 " 15.00 " 8 " 20.00																													
<b>FIG. 190.</b> To fit 2 in. pipe . \$5.00 " 2½ " . 6.00 " 3 " . 8.00 " 4½ " . 10.00 " 6 " . 15.00		<b>FIG. 191.</b> To use with 1 in. hollow rods \$2.00 1¼ " " 4.00																															
<b>FIG. 192.</b> To fit 1 in. pipe . \$2.00 " 1¼ " . 2.00 " 2 " . 4.00		<b>FIG. 194.</b> <table><tr><td>¾ in.</td><td>1 in.</td><td>1¼ in.</td><td>1½ in.</td><td>2 in.</td><td>2½ in.</td><td>3 in.</td></tr><tr><td>\$15.00</td><td>20.00</td><td>25.00</td><td>32.00</td><td>40.00</td><td>50.00</td><td>75.00</td></tr><tr><td>3¾ in.</td><td>4 in.</td><td>4½ in.</td><td>5 in.</td><td>6 in.</td><td>7 in.</td><td>8 in.</td></tr><tr><td>\$85.00</td><td>95.00</td><td>100.00</td><td>110.00</td><td>120.00</td><td>130.00</td><td>140.00</td></tr></table>				¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	\$15.00	20.00	25.00	32.00	40.00	50.00	75.00	3¾ in.	4 in.	4½ in.	5 in.	6 in.	7 in.	8 in.	\$85.00	95.00	100.00	110.00	120.00	130.00	140.00
¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.																											
\$15.00	20.00	25.00	32.00	40.00	50.00	75.00																											
3¾ in.	4 in.	4½ in.	5 in.	6 in.	7 in.	8 in.																											
\$85.00	95.00	100.00	110.00	120.00	130.00	140.00																											

Pipe Lifting Clevis.

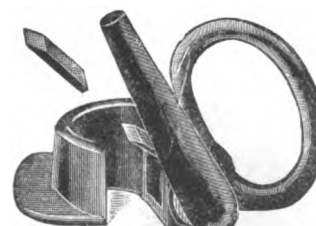


FIG. 171 1/2.

**FIG. 171 1/2.**  
For 1 and 1 1/4 in. pipe . . . \$2.00

# GOULDS TUBULAR WELL SUPPLIES.

**END PIPE REAMER,**  
for reaming ends of pipe so that the  
plunger leathers will not catch in the  
joints.



FIG. 195.

**LIFTING or HOLDING  
TONGS.**



FIG. 21.

Size Pipe.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
300 ft. wells.	\$5.00	\$6.00	\$7.50	\$8.00	\$10.00
500 ft. wells.			8.00	10.00	12.00
1000 ft. wells.			10.00	12.00	14.00

**SLIDING or FRICTION  
TONGS.**



FIG. 23.

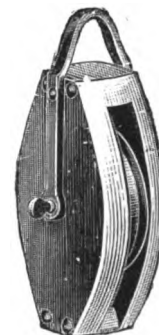


FIG. 196.

Single Pulley Block,	\$5.00
Double " "	10.00
Treble " "	15.00

For reaming ends 2 in. pipe,	\$3.00
" " " 2½ " "	4.00
" " " 3 " "	6.00
" " " 4½ " "	10.00

**DRIVE TOP -- Hollow,**  
made of pipe, with steel rings, and  
will outlast any other style made.

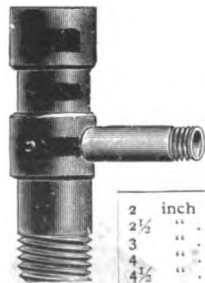


FIG. 197.

2 inch	\$5.00
2½ " "	6.00
3 " "	8.00
4 " "	10.00
4½ " "	12.00
6 " "	20.00

**Valve Grab. Strainer Grab.**



FIG. 197½. FIG. 196½.

For working inside of	2 or 2½ in.	3 in.	4½ in.	6 in.
Valve Grab. Fig. 197½	\$2.00	\$3.00		
Strainer Grab. Fig. 196½	2.00	2.50		
Friction Grab. Fig. 195½	2.00	3.00	\$6.00	\$10.00
Spring Grab. Fig. 194½		4.00	6.00	8.00

**Friction Grab. Spring Grab.**



FIG. 195½.



FIG. 194½.



# GOULDS TUBULAR WELL SUPPLIES.

Fig. 192½, Outside Pipe Puller, is used in connection with the Jack Screws to pull pipe out of the ground.

PRICE WITHOUT JACK SCREWS.

No. 2, with 1-inch and 2-inch dies	\$4.00
" 3, " 2 " 3 "	5.00
" 6, " 4½ " 6 "	15.00
" 8, " 6 " 8 "	20.00

Other sizes, prices on application.

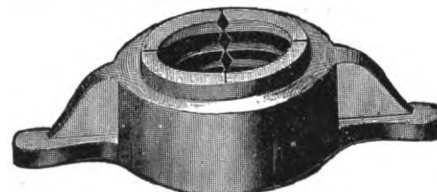


FIG. 192½.

## EXTRA DIES FOR OUTSIDE PIPE PULLERS.

NO. OF PIPE PULLER DIES ARE USED WITH,	1-inch.	1¼-inch.	2-inch.	2½-inch.	3-inch.	4½-inch.	6-inch.	8-inch.
No. 2, per set	\$0.80	\$0.70	\$0.75					
" 3, " "	1.00	.90	.80	\$0.75	\$0.75			
" 6, " "		5.00	4.25	3.75	3.00	\$2.75	\$2.25	
" 8, " "			7.00	6.50	6.00	5.00	4.00	\$3.00

## DERRICK IRONS AND PINS.

USED AT THE TOP OF THE DERRICK.

### PULLEY HOOKS.

To hang Pulley on Derrick Iron.

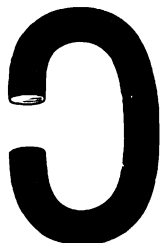


FIG. 191½.



FIG. 190½.

No. 1, size used with 300 feet outfit	\$3.00
No. 2, heavy	5.00

### ROD PACKING,

To put on Drill Rods and use as a packing to test wells.



FIG. 189½.

## INSIDE PIPE FULLER OR CASING SPEAR.

THIS IS USED FOR PULLING PIPE BROKEN OFF UNDER GROUND.



FIG. 188½.

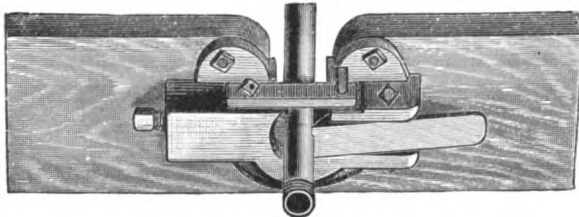
1 in. for 2 in. wells,	\$2.00
1 " 2½ "	3.00
1½ " 3 "	5.00
1½ " 4½ "	8.00

No. 1	\$2.50
No. 2, heavy	5.00

Fitted for ¼ inch pipe to pull 1¼ inch pipe	\$5.00
" 1 " " 2 "	7.00
" 1½ " " 3 "	10.00
" 2 " " 4½ "	16.00
" 2½ " " 6 "	25.00

# GOULDS TUBULAR WELL SUPPLIES.

**LITTLES PATENT AUTOMATIC PIPE HOLDER.**

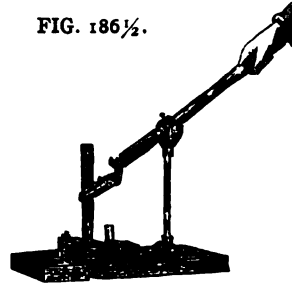


**FIG. 187½.**

Price . . . . . \$5.00 each.

**BABCOCKS PIPE LIFTER AND HOLDER.**

**FIG. 186½.**



For 1-in. and 1¼-in. pipe, \$7.00

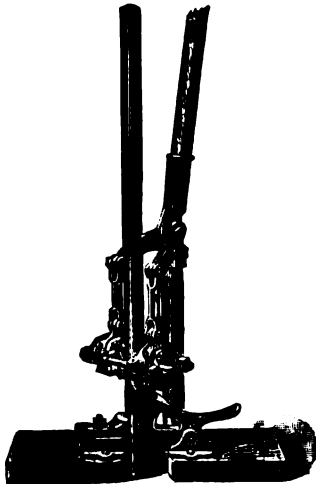
**PIPE LIFTER.**



**FIG. 185½.**

Size pipe in inches tool is used for.	1¼	2	2½
Size pipe connect to.	¾	1	1¼
Price.	\$2.50	\$3.00	\$3.50

**THE STANDARD AUTOMATIC PIPE LIFTER AND HOLDER.**

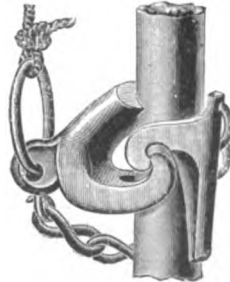


**FIG. 184½.**

For holding 1, 1¼, or 1½ in. pipe.  
\$10.00 net.

**AUTOMATIC PIPE GRAPPLE.**

For pulling or holding rods or well pipe.



**FIG. 183½.**

For holding	1 in.	\$3.50
"	1¼ "	3.50
"	2 "	5.00
"	2½ "	6.00
"	3 "	7.50

**PIPE DOG.**



**FIG. 182½.**

To pull 1 inch Rods . . .	\$5.00
" 1¼ " " . . .	6.00

**ROD LIFTER.**

For raising drill rods.



**FIG. 180½.**

To pull 1 in. rod . . . .	\$3.00
" 1¼ " " . . . .	5.00

**ROPE HOOK.**

This is fastened to one end of the rope. A very handy tool, saves tying and untying the rope.



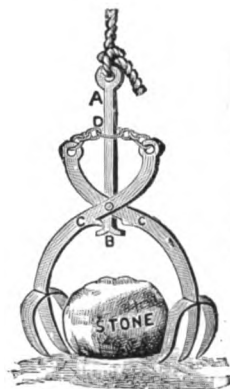
**FIG. 181½.**

Price . . \$2.00

# GOULDS TUBULAR WELL SUPPLIES.

**FIG. 179½. STONE GRAPPLE.**

Is used to remove stones and boulders from bored wells.

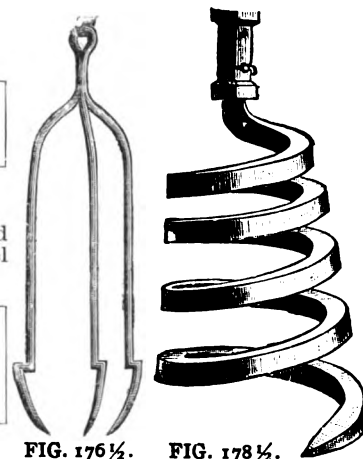


4 inch	.....	\$6.00
6 "	.....	8.00
8 "	.....	12.00
12 "	.....	16.00
16 "	.....	20.00

**FIG. 178½. RAM'S HORN.**

Is used for loosening stones and boulders in bored wells, and the small sizes are often used to remove pieces of iron and steel and other small objects from drilled wells.

4 inch	.....	\$6.00
5 "	.....	8.00
6 "	.....	10.00
7 "	.....	12.00
8 "	.....	14.00
12 "	.....	18.00
16 "	.....	20.00



**FIG. 179½.**

**FIG. 176½. TILE SETTER.**

For setting tile in Bored Wells.

**FIG. 176½. FIG. 178½.**

16 inch	.....	\$12.00
12 "	.....	10.00
6 "	.....	8.00
4 "	.....	5.00

**Chain Swivel.**

**CHAIN SWIVEL.**

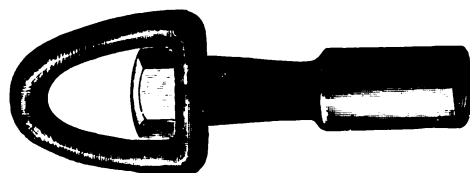
Usually welded to the chain that connects tools to walking beam.

**Hand Swivel.**

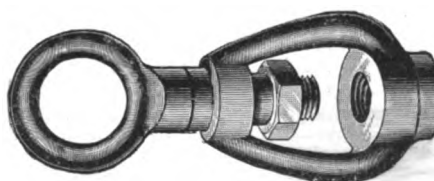
**HAND SWIVEL.**

Is fastened to bottom of cable weight and is used when drawing the tools. It is so arranged that it is disconnected from the tools in an instant.

**FIG. 174½. PRICE, \$15.00.**



**FIG. 175½. PRICE, \$12.00.**



**POLE SLIPS OR JARS.**

Used on the poles when sand pumping or fishing, where it is required to give only a light jar.



**FIG. 173½.**

Size, inches	3	3½	3¾	4	4½
Price, each	\$25.00	\$30.00	\$35.00	\$40.00	\$45.00

## MANILA WELL ROPE.

HAWSER LAID MANILA ROPE, FOR OIL AND ARTESIAN WELLS.

Weights about 1-5 less than estimates in the table below.

Size In Diam.	Weight of 100 ft.	Strength of New Rope.	Size In Diam.	Weight of 100 ft.	Strength of New Rope.
¼ in.	3 lbs.	450 lbs.	1 ¾ in.	54 lbs.	13500 lbs.
5-16 "	4 "	750 "	1 7-16 "	62 "	15500 "
¾ "	5 ½ "	900 "	1 ½ "	67 "	17000 "
7-16 "	7 "	1250 "	1 ⅝ "	84 "	19900 "
1 ¼ "	8 "	1700 "	1 ¾ "	100 "	23500 "
9-16 "	11 "	2300 "	2 "	100 "	29300 "
5/8 "	15 "	3000 "	2 ¼ "	102 "	37000 "
¾ "	17 "	4000 "	2 ½ "	170 "	42000 "
13-16 "	21 "	5000 "	2 ⅝ "	192 "	48000 "
¾ "	25 "	5800 "	2 ¾ "	217 "	54000 "
1 "	33 "	7000 "	2 ⅞ "	243 "	61000 "
1 1-16 "	36 "	8000 "	3 "	276 "	67000 "
1 ¼ "	42 "	9200 "	3 ½ "	350 "	96000 "
1 ½ "	46 "	11000 "			

Prices on application. We keep only the very best, as that is the cheapest.

## LEAD PIPE.

Weight per Foot.

Size, Inches . .	¾	½	⅜	¼	⅓	1	1 ¼	1 ½	1 ¾	2
	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
Aqueduct . .	8 . 10	12 . 1	1 . 8	1 . 8	2 . 8	2 . 8	3 . 8	4 . 8	5 . 8	6 . 8
Extra light . .	9 . 12	1 . 12	2 . 8	2 . 8	3 . 8	4 . 8	5 . 8	6 . 8	7 . 8	8 . 8
Light . . . .	12 . 1	1 . 12	2 . 8	2 . 8	3 . 8	4 . 8	5 . 8	6 . 8	7 . 8	8 . 8
Medium . . . .	1 . 1	2 . 4	3 . 8	4 . 8	5 . 8	6 . 8	7 . 8	8 . 8	9 . 8	10 . 8
Strong . . . .	1 . 8	1 . 12	2 . 8	3 . 8	4 . 8	5 . 8	6 . 8	7 . 8	8 . 8	9 . 8
Extra Strong . .	2 . 2	3 . 8	4 . 8	5 . 8	6 . 8	7 . 8	8 . 8	9 . 8	10 . 8	11 . 8
Extra ex. Strong .	3 . 3	4 . 8	5 . 8	6 . 8	7 . 8	8 . 8	9 . 8	10 . 8	11 . 8	12 . 8

Price per lb., at Market Rates.

## SHEET LEAD.

Weights and Sizes.

Lbs., per Sq. Ft.,	2 ½	3	3 ½	4	4 ½	5	6	7	8	9	10	11	12
Wire Gauge No.,	19	18	17	16	15	14	13	12	11	10	9	8	7
Thickness, In.,	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16

Price per lb., Market Rates.

Sheet Lead rolled to any other weight per square foot to order.

## PLIABLE HOISTING ROPE.

WITH SIX STRANDS OF 19 WIRES EACH.

### PRICE LIST, IRON.

Trade No.	Diameter in Inches.	Price per Foot.	Circumference in Inches.	Estimated Weight per Foot in Pounds.	Breaking Stress in Tons of 2,000 Pounds.	Proper Working Load in Tons of 2,000 Pounds.	Circumference of Hemp Rope of equal Strength.	Minimum Diameter of Drum or Sheave in ft.
6	1 ¼	\$0.44	4	2.50	27	5 ½	9 ½	4
7	1 ½	.36	3 ½	2.00	20	4	8	3 ½
8	1	.29	3 ⅝	1.58	16	3	7	3
9	¾	.23	2 ¾	1.20	11.50	2 ½	6	2 ¾
10	¾	.18	2 ¾	.88	8.64	1 ¾	5	2 ½
10 ¼	¾	.16	2	.60	5.13	1 ¼	4 ½	2
10 ½	9-16	.12 ½	1 ¾	.44	4.27	¾	4	1 ¾
10 ¾	1 ¼	.10	1 ½	.35	3.48	¾	3 ½	1 ½
10 ¾	7-16	.09 ½	1 ⅝	.29	3	¾	3 ½	1 ½
10b	¾	.09	1 ¼	.26	2.50	¾	3	1 ½
11	5-16	.08	1	.16	1	¾	3	1 ½
12	¾	.07	¾	.09	1	¾	3	1 ½

## SPECIAL CAST STEEL.

6	1 ¼	\$0.50	4	2.50	52	10	11 ½	5
7	1 ½	.41	3 ½	2	42	8	10	4 ½
8	1	.34	3 ⅝	1.58	33	6	9 ½	4
9	¾	.27	2 ¾	1.20	25	5	8	3 ½
10	¾	.21	2 ¾	.88	18	3 ½	6 ½	3 ½
10 ¼	¾	.17	2	.60	14	2 ½	5 ½	3
10 ½	9-16	.15	1 ¾	.44	9	1 ¾	4 ½	2 ¾
10 ¾	1 ¼	.13	1 ½	.35	7 ½	1 ½	4 ½	2 ½
10 ¾	7-16	.12 ½	1 ⅝	.29	6	1 ¼	4	2 ½
10b	¾	.12	1 ¼	.26	4 ½	¾	3 ½	1 ¾
11	5-16	.11	1	.16	4	¾	3	1 ¾

Siemens-Martin (open hearth) Steel and Bessemer Steel Ropes, the same list price as Iron Ropes.

The prices and weights above stated are for Ropes with HEMP CENTRES. For Ropes made with WIRE CENTRES add TEN PER CENT. to these weights and prices

# FINISHED AND BALANCED IRON PULLEYS.

FIG. 43. SIZES AND PRICES.

Inches.		WIDTH FACE OF PULLEY.				Inches.		WIDTH FACE OF PULLEY.			
		1 to 3	4	5	6			4	5	6	8
Diameter of Pulley.	6	\$1.85	\$1.98	\$2.10	\$2.30	Diameter of Pulley.	28	\$7.20	\$7.95	\$9.00	\$10.80
	7	2.00	2.24	2.48	2.70		30	7.65	8.62	9.75	12.00
	8	2.21	2.37	2.63	2.87		32	8.25	9.38	10.73	13.65
	9	2.40	2.63	2.90	3.18		34	9.00	10.20	11.55	14.40
	10	2.55	2.78	3.08	3.36		36	9.90	11.25	12.60	15.60
	12	2.93	3.15	3.45	3.75		38	11.10	12.45	14.10	17.25
	14	3.23	3.53	3.75	4.13		40	12.00	13.50	15.45	18.38
	16	3.60	3.83	4.05	4.43		42	13.35	14.55	16.35	19.35
	18	4.20	4.35	4.15	5.03		44	14.85	15.60	17.40	20.85
	20	4.80	4.95	5.25	5.63		46	16.65	17.32	18.60	22.13
	22	5.40	5.55	5.85	6.30		48	18.15	. . .	19.80	23.40
	24	6.00	6.30	6.75	7.50		50	19.73	. . .	21.53	24.98
	26	6.38	6.75	7.35	8.25						

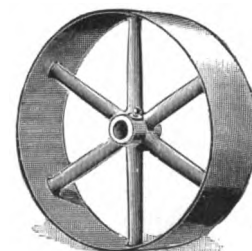


FIG. 43.

We do not make 16-inch diameter pulley and larger less than 3-inch width of face.

In making orders, specify style—finished and balanced, plain, split, clamp, or tight and loose, together with diameter, width face and bore, and whether crowning or straight face, and for single or double belt.

NOTE.—To the list of prices for plain pulleys we add extra, as follows:—

	6 to 12 Inches Diameter.	14 to 24 Inches Diameter.	26 to 36 Inches Diameter.	36 to 50 Inches Diameter.
For Split Pulleys . . . . .	40 per cent.	30 per cent.	20 per cent.	15 per cent.
For Clamp Pulleys . . . . .	25 " "	20 " "	12½ " "	10 " "
For Tight and Loose Pulleys . . . . .	15 " "	10 " "	5 " "	5 " "

# PATENT WOOD SPLIT PULLEY.

FIG. 44. SIZES AND PRICES.

Inches.		WIDTH FACE OF PULLEY.				Inches.		WIDTH FACE OF PULLEY.			
		3	4	5	6			4	5	6	8
Diameter of Pulley.	9	\$2.50	\$2.65	\$2.90	\$3.15	Diameter of Pulley.	30	\$8.00	\$8.60	\$9.40	\$11.50
	10	2.60	2.75	3.00	3.25		32	8.80	9.40	10.30	12.90
	12	2.80	2.95	3.20	3.55		34	9.60	10.50	11.50	14.50
	14	3.00	3.25	3.65	4.10		36	10.60	11.90	13.00	16.00
	16	3.30	3.65	4.05	4.60		38	. . .	. . .	14.50	17.60
	18	3.70	4.05	4.55	5.10		40	. . .	. . .	16.00	19.00
	20	. . .	4.45	5.20	6.00		42	. . .	. . .	17.50	21.50
	22	. . .	4.95	5.90	6.85		44	. . .	. . .	19.50	23.75
	24	. . .	5.40	6.35	7.30		46	. . .	. . .	22.00	26.00
	26	. . .	6.35	7.00	7.95		48	. . .	. . .	24.50	28.00
	28	. . .	7.20	7.80	8.60		50	. . .	. . .	. . .	31.50

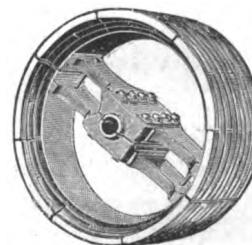


FIG. 44.

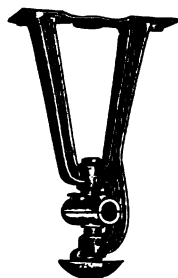


FIG. 38.

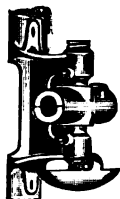


FIG. 39.



FIG. 40.



FIG. 41.



FIG. 42.

## ADJUSTABLE BALL AND SOCKET HANGERS.

WITH BABBITTED BEARINGS.

FIG. 38. SIZES AND PRICES.

Size, Inches.	8-inch Drop.	9-inch Drop.	10-inch Drop.	12-inch Drop.	13-inch Drop.	15-inch Drop.	18-inch Drop.	21-inch Drop.	24-inch Drop.	30-inch Drop.	Size, Inches.
1½	\$3.83	\$3.90	\$3.98	\$4.05	\$4.13	\$4.35	\$4.58	\$4.80	\$5.10	\$6.00	1½
1½	4.35	4.50	4.58	4.73	4.80	5.10	5.33	5.70	6.30	7.05	1½
1¾	4.73	4.95	5.25	5.70	5.85	6.08	6.38	6.60	6.98	8.33	1¾
2	5.78	6.00	6.38	6.75	7.05	7.28	7.50	7.95	8.40	9.83	2
2¼	6.60	6.83	7.20	7.58	7.80	8.03	8.25	8.85	9.30	10.80	2¼
2½	7.88	8.10	8.40	9.30	9.75	10.20	10.80	11.18	11.63	12.90	2½
2¾	8.70	8.93	9.23	10.20	10.65	11.25	11.85	12.30	12.75	14.25	2¾
3	11.70	12.00	12.30	13.05	13.43	13.88	14.25	14.70	15.45	18.00	3
3¼	13.50	13.88	14.25	15.00	15.60	16.13	16.72	17.25	18.00	21.00	3¼

## BALL AND SOCKET POST HANGER.

WITH BABBITTED BEARINGS.

FIG. 39. SIZES AND PRICES.

Size, Inches .	1½	1½	1½	2	2¼	2½	2¾	3	3¼
Price . . . .	\$3.15	\$3.38	\$3.75	\$5.63	\$6.23	\$8.85	\$9.90	\$12.15	\$17.25

## BALL AND SOCKET PILLOW BLOCK.

WITH BABBITTED BEARINGS.

FIG. 40. SIZES AND PRICES.

Size, Inches .	1½	1½	1½	2	2¼	2½	2¾	3	3¼
Price . . . .	\$3.15	\$3.53	\$3.98	\$5.48	\$6.53	\$8.33	\$10.50	\$13.50	\$16.13

## WALL BOX.

FIG. 41. SIZES AND PRICES.

Size, Inches .	1½	1½	1½	2	2¼	2½	2¾	3	3¼
Price . . . .	\$2.85	\$3.00	\$3.53	\$3.90	\$4.58	\$6.08	\$8.70	\$11.40	\$14.25

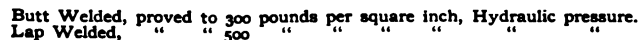
## FLANGED FACED COUPLING.

FIG. 42. SIZES AND PRICES.

Size, Inches .	1½	1½	1½	2	2¼	2½	2¾	3	3¼
Price . . . .	\$6.38	\$7.35	\$8.77	\$10.50	\$12.60	\$14.85	\$17.70	\$21.38	\$25.50

## PATENT COLD ROLLED STEEL SHAFTING.

Size, Inches .	1½	1½	1½	2	2¼	2½	2¾	3	3¼
Price per foot	\$0.31	\$0.45	\$0.61	\$0.80	\$1.01	\$1.25	\$1.52	\$1.80	\$2.20



BUTT WELDED.								LAP WELDED.										
NOMINAL INSIDE DIA.	1/8 IN.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/4	3	3 1/2	4	4 1/2	5	6	7	8
Black . . . . . per foot,	\$0.05 1/2	\$0.05 1/2	\$0.05 1/2	\$0.07	\$0.08 1/2	\$0.11 1/2	\$0.15 1/2	\$0.26	\$0.35	\$0.52	\$0.68	\$0.81	\$0.95	\$1.25	\$1.42	\$1.85	\$2.45	\$2.95
Galvanized . . . . .	.08	.07 1/2	.07 1/2	.09 1/2	.11 1/2	.16 1/2	.22	.31	.42	.62	.80	.98	1.16	1.50	1.75	2.20	3.00	3.70
Extra Strong . . . . .	.11	.11	.11	.14	.17	.23 1/2	.31	.52	.70	1.04	1.36	1.62	1.90	2.50	2.84	3.70	4.90	5.90
Double Ex. Strong, "	.22	.22	.22	.28	.34	.47	.62	1.04	1.40	2.08	2.72	3.24	3.80	5.00	5.68	7.20	9.80	11.80

REVISED LIST OF JAN. 29, 1895.











NOMINAL INSIDE DIA.	2 IN.	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 3-16	5 1/2	6 1/4	6 1/2	7 1/4	7 1/2	8 1/4	8 1/2	9 1/2	10 1/2
Price per foot	\$0.24	\$0.26	\$0.27	\$0.29	\$0.32	\$0.35	\$0.37	\$0.43	\$0.46	\$0.50	\$0.52	\$0.58	\$0.61	\$0.63	\$0.73	\$0.85	\$0.93	\$1.06	\$1.22	\$1.20	\$1.51	\$1.80	\$2.13

REVISED LIST OF JAN. 29, 1895.

NOMINAL OUTSIDE DIA.	1 IN.	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½
Price per foot . . . . .	\$0.37	\$0.35	\$0.32	\$0.32	\$0.30	\$0.32	\$0.36	\$0.39	\$0.39	\$0.45	\$0.48	\$0.55	\$0.60	\$0.69







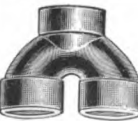

*All list prices and discounts on Pipe Casing and Boiler Tubes subject to change without notice.*

# CAST-IRON FITTINGS FOR WROUGHT-IRON PIPE.

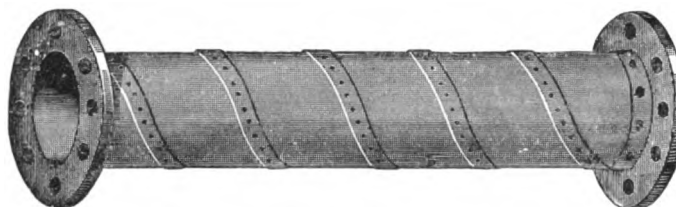
	Size, Inches.	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
	Couplings, Wrought . . . . .	\$0.05	\$0.06	\$0.07	\$0.10	\$0.13	\$0.17	\$0.21	\$0.28	\$0.40	\$0.60	\$0.80	\$1.00	\$1.50	\$1.65	\$2.40
	"    "    Galv. . . . .	.06	.08	.10	.13	.18	.25	.32	.40	.55	.80	1.05	1.40	2.00	2.25	3.25
	Elbows, Cast . . . . .	.04	.05	.06	.09	.13	.20	.25	.40	.75	1.10	1.35	1.80	2.50	2.85	3.90
	"    "    Galv. . . . .	.06	.09	.12	.18	.30	.45	.55	.85	1.60	2.35	3.10	4.10	6.00	7.00	11.00
	"    "    Reducing and R. and L. . . . .	.05	.06	.07	.11	.16	.23	.29	.46	.85	1.25	1.50	2.10	3.00	3.25	4.50
	"    "    Galv. . . . .	.10	.12	.14	.22	.32	.46	.58	.92	1.70	2.50	3.00	4.20	6.00	6.50	9.00
	Elbow, Cast, 45° . . . . .		.10	.10	.15	.20	.26	.35	.50	1.30	1.60	1.90	2.50	3.50	4.50	5.50
	"    "    Galv. . . . .		.20	.20	.30	.40	.50	.70	1.00	2.60	3.20	4.75	5.00	7.00	9.00	11.00
	Tees, Cast . . . . .	.06	.07	.09	.13	.20	.30	.38	.60	1.10	1.50	2.00	2.50	3.50	4.00	5.50
	"    "    Galv. . . . .	.08	.13	.17	.25	.40	.60	.85	1.20	2.25	2.85	3.80	5.25	7.00	8.00	12.50
	"    "    Reducing . . . . .	.07	.08	.11	.15	.23	.35	.44	.70	1.25	1.75	2.30	2.90	4.00	4.60	6.35
	"    "    Galv. . . . .	.14	.16	.22	.30	.46	.70	.88	1.40	2.50	3.50	4.60	5.80	8.00	9.20	12.70
	Crosses, Cast . . . . .	.08	.10	.12	.18	.28	.40	.50	.80	1.50	2.20	2.70	3.50	5.00	5.70	7.80
	"    "    Galv. . . . .	.15	.18	.23	.35	.55	.80	1.00	1.60	3.00	4.25	5.50	7.00	9.00	10.50	16.00
	"    "    Reducing . . . . .	.10	.12	.14	.21	.32	.46	.58	.92	1.70	2.50	3.00	4.00	6.00	6.60	9.00
	"    "    Galv. . . . .	.20	.24	.28	.42	.64	.92	1.16	1.84	3.40	5.00	6.00	8.00	12.00	13.20	18.00
	Bushings, Cast . . . . .		.05	.06	.07	.09	.13	.17	.27	.42	.60	.80	1.00	1.50	1.85	2.50
	"    "    Galv. . . . .		.06	.07	.10	.14	.21	.30	.44	.60	1.00	1.40	1.50	2.25	3.00	4.00
	Plugs, Cast . . . . .	.03	.03	.04	.05	.06	.10	.13	.20	.35	.50	.75	.85	1.35	1.75	2.40
	"    "    Galv. . . . .	.05	.05	.06	.08	.10	.15	.23	.35	.57	.95	1.35	1.60	2.35	3.50	4.65
	Caps, Cast . . . . .	.03	.03	.05	.08	.11	.15	.22	.30	.50	.80	1.10	1.30	1.60	2.00	2.35
	"    "    Galv. . . . .								.60	1.00	1.60	2.20	2.60	3.20	4.00	4.70
	Reducers, Cast . . . . .	.05	.06	.09	.12	.18	.25	.36	.50	.75	1.20	1.50	2.00	2.75	3.00	4.00
	"    "    Galv. . . . .								.75	1.20	1.80	2.25	3.00	4.50	5.00	6.00



# CAST-IRON FITTINGS FOR WROUGHT-IRON PIPE.

	Size, Inches.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
	Locknuts, Cast . . . . .	\$0.04	\$0.04	\$0.06	\$0.07	\$0.08	\$0.10	\$0.12	\$0.25	\$0.40	\$0.50	\$0.70	\$0.95	\$1.25	\$1.35	\$1.90
	"    "    Galv. . . . .															3.00
	Return Bends, Close . . . . .			.10	.15	.22	.34	.45	.75	1.50	2.25	4.00	5.00			
	"    "    "    Galv. . . . .			.20	.30	.44	.68	.90	1.50	3.00	4.50					
	"    "    Open . . . . .			.15	.20	.30	.48	.68	1.15	1.75	2.75	4.50	5.75	8.00		
	"    "    "    Galv. . . . .			.30	.40	.60	.96	1.36	2.30	3.50	5.50					
	Unions, Malleable . . . . .	.15	.18	.20	.28	.34	.46	.60	.80	1.50	2.10	3.00	4.00			
	"    "    Galv. . . . .		.24	.27	.37	.50	.70	.90	1.20	2.25	2.90					
	Flange Unions, Cast. . . . .			.60	.65	.70	.85	1.15	1.50	1.75	2.25	2.75	3.15	4.50	5.00	6.50
	"    "    "    Galv. . . . .			1.20	1.30	1.40	1.70	2.30	3.00	3.50	4.50	5.50	6.30	9.00	10.00	13.00
	Nipples, Wrought, Short . . . . .	.05	.06	.07	.09	.10	.14	.17	.25	.56	.75	1.00	1.25	1.75	2.00	2.75
	"    "    "    Galv. . . . .	.07	.08	.09	.11	.13	.17	.23	.32	.65	1.00	1.25	1.45	1.90	2.40	3.50
	"    "    Long . . . . .	.07	.09	.10	.11	.15	.20	.25	.35	.75	.95	1.25	1.60	2.25	2.60	3.60
	"    "    "    Galv. . . . .	.09	.11	.13	.16	.19	.24	.31	.40	1.85	1.20	1.50	1.90	2.40	3.00	4.40
	Return Bends, B. O., Cast . . . . .				.30	.40	.60	.90	1.25	2.25	3.25					
	"    "    "    Galv. . . . .				.60	.90	1.30	1.80	2.70							
	Y Branches, Cast . . . . .			.25	.30	.40	.60	.90	1.25	2.25	3.25	4.50	6.00		9.00	12.00
	"    "    Reducing . . . . .			.29	.35	.46	.70	1.35	1.90	2.60	3.75	5.20	6.90		10.35	13.80
	"    "    Galv. . . . .			.50	.60	.80	1.20	1.80	2.50	4.50	6.50	9.75	12.00		18.00	24.00

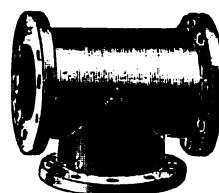
# DOUBLE GALVANIZED SPIRAL RIVETED PRESSURE PIPE.



Inside diameter, inches. . . . .	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24
Price per lineal foot inc'd'g flanges,	\$0.50	.70	1.00	1.20	1.40	1.70	2.00	2.60	2.85	3.15	3.60	4.00	4.40	5.15	6.40	7.95	10.00	12.00
Thickness, Birmingham Gauge, No.	20	20	20	18	18	18	18	16	16	16	14	14	14	14	14	14	12	12
Nominal weight, per foot in pounds,	1 1/2	3	4	5	6	7	8	11	12	14	15	20	22	24	29	34	40	40

Manufactured in lengths of 20 feet and not less than 6 feet without extra charge.

## GALVANIZED CAST AND WROUGHT IRON FITTINGS.



Inside Dia. Inches.	Elbows.	Tees.	Crosses.	Reducers.	Flanges.	Disks or Blind Flanges.	Bolts and Nuts.	Composition Gaskets.
3	\$1.60	\$2.75	\$4.15		\$0.39	\$0.45	\$0.04	\$0.09
4	2.10	3.25	5.30	* \$3.00	.52	.65	.04	.10
5	2.85	4.40	6.70	* 3.50	.65	.78	.04	.12
6	4.10	5.70	8.00	* 4.75	.78	1.17	.04 1/2	.16
7	5.10	7.30	11.00	* 5.50	1.04	1.56	.04 1/2	.18
8	6.70	9.80	14.25	* 6.50	1.17	1.82	.04 1/2	.23
9	9.00	13.80	18.80	* 8.00	1.56	2.34	.04 1/2	.31
10	10.00	17.60	24.50	* 10.25	1.82	2.47	.04 1/2	.40
11	* 13.00	* 20.00	* 26.50	* 12.00	1.95	3.25	.04 1/2	.45
12	15.80	22.50	30.00	* 13.00	2.08	3.90	.04 1/2	.50
13	19.15	* 25.00	* 33.50	* 14.60	2.34	4.55	.04 1/2	.56
14	* 22.30	* 30.50	* 38.00	* 16.50	2.60	5.46	.05	.63
15	26.00	* 37.00	* 45.00	* 18.40	3.12	5.98	.05	.75
16	* 30.00	* 44.00	* 53.00	* 21.30	4.42	6.76	.05	.90
18	* 34.00	* 50.00	* 59.00	* 26.00	5.07	9.10	.05	1.08
20	* 38.50	* 56.00	* 67.00	* 29.40	5.59	11.70	.05	1.25
22	* 42.00	* 60.00	* 77.00	* 33.00	9.10	14.30	.05 1/2	1.75
24	* 45.00	* 70.00	* 87.00	* 37.00	9.75	16.90	.05 1/2	2.00

\* All Fittings marked thus are riveted sheet iron; all others are cast iron.

## GOULDS SIAMESE COUPLINGS.



FIG. 92.

Size, Inches.	2	2½
Fig. 92, to divide one stream	\$9.00	\$10.00
" 93, to unite two streams	9.00	10.00



FIG. 93.

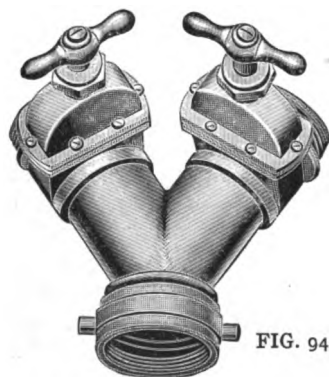


FIG. 94.

## SIAMESE COUPLINGS WITH GATES.

Size, Inches.	2	2½
Fig. 94, to divide one stream	\$25.00	\$30.00
" 95, to unite two streams	25.00	30.00



FIG. 95.

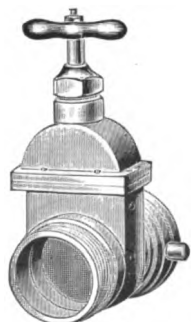


FIG. 96.

## SINGLE AND DOUBLE HYDRANT GATES.

Size, Inches.	2	2½
Fig. 96, Single Gate	\$9.00	\$10.00
" 97, Double Gate	22.50	25.00

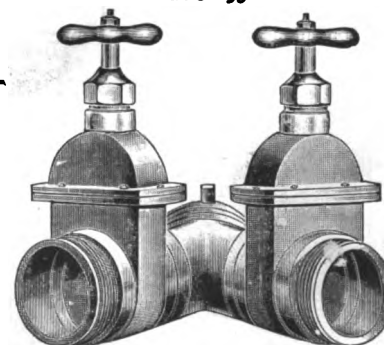
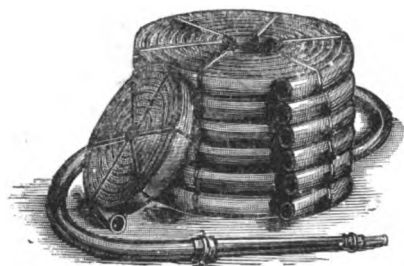


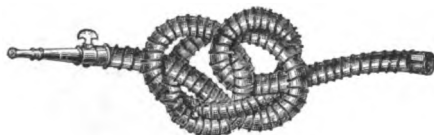
FIG. 97.

# RUBBER WATER HOSE.



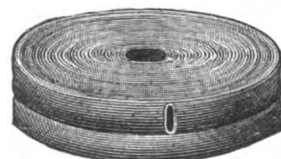
Internal diameter, Inches.	2-PLY.	3-PLY.	4-PLY.	5-PLY.	6-PLY.
	Conducting, per ft.	Hydrant, per ft.	Engine, per ft.	Engine, per ft.	Engine, per ft.
1/4	\$0.20	\$0.25	\$0.30	\$0.37	\$0.45
3/4	.25	.30	.37	.46	.55
1	.33	.40	.50	.62	.75
1 1/4	.42	.50	.62	.77	.93
1 1/2	.50	.60	.75	.93	1.12
2	.66	.80	1.00	1.25	1.50
2 1/2	.83	1.00	1.25	1.56	1.87
3	.99	1.20	1.50	1.87	2.25
3 1/2	1.15	1.40	1.75	2.18	2.62
4	1.32	1.60	2.00	2.50	3.00

EXTRA FOR WINDING WATER HOSE WITH GALVANIZED STEEL WIRE.



	3-Ply.	4-Ply.	5-Ply.	6-Ply.
1/4 in., per foot,	\$0.03	\$0.04	\$0.05	\$0.06
3/4 " "	.04	.05	.06	.07
1 " "	.05	.07	.08	.09
1 1/4 " "	.07	.08	.09	.10
1 1/2 " "	.08	.09	.10	.11
2 " "	.10	.11	.12	.13
2 1/2 " "	.12	.13	.14	.15

LINEN HOSE, SEAMLESS, UNLINED AND RUBBER LINED.



Mill Hose.

Internal diameter, inches . . . . .	1/4	3/4	1	1 1/4	1 1/2	2	2 1/4	3
Standard, Unlined, per foot . . .	. .	. .	\$0.20	\$0.22	\$0.25	\$0.30	\$0.35	\$0.50
" Rubber Lined, " . . .	\$0.20	\$0.25	.35	.50	.55	.65	.75	1.00
Underwriters, Unlined, " . . .	. .	. .	.35	.45	.54	.70	.80	. .
" Rubber Lined, " . . .	. .	. .	.70	.80	.94	1.18	1.38	. .

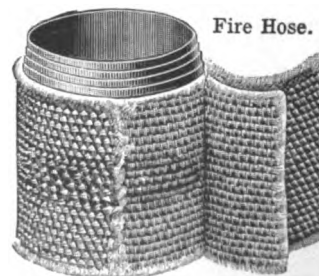
In 50-ft. lengths.

COTTON MILL HOSE—SEAMLESS WOVEN AND RUBBER LINED.

Internal diameter, inches,	1	1 1/4	1 1/2	2	2 1/4	3
Price per foot . . . . .	\$0.35	\$0.45	\$0.50	\$0.60	\$0.70	\$1.00

COTTON FIRE HOSE—SEAMLESS WOVEN AND RUBBER LINED.

Samples and prices furnished upon application.



Fire Hose.

**"SMOOTH BORE" RUBBER SUCTION HOSE.**

### HARD RUBBER SUCTION HOSE.

## EXTRA HEAVY STEAM AND OIL HOSE.

\* RUBBER TUBING.

\* Made in 12-ft. lengths.



FIG. 504.

## GOULDS BRASS HOSE COUPLINGS.

Size, inches . . . . .	$\frac{1}{2}$	$\frac{3}{4}$	1
Fig. 504, per dozen . . . . .	\$3.00	\$3.00	\$4.50



FIG. 497.

## BRASS HOSE COUPLINGS.

Size, inches . . . . .	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
Fig. 497, per dozen . . . . .	\$10.00	\$14.00	\$30.00	\$48.00	\$76.00	\$150.00	\$250.00	\$350.00

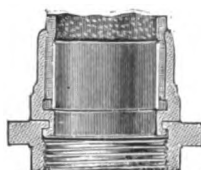


FIG. 35.

## PATENT EXPANDED RING SCREW COUPLINGS.

Size, inches . . . . .	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Fig. 35, per set . . . . .	\$3.00	\$3.00	\$4.00	\$5.00

## BRASS HOSE CLAMPS.



FIG. 59.

Sizes, inches . . . . .	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Fig. 59, per dozen . . . . .	\$1.50	\$1.50	\$2.00	\$2.50	\$3.00	\$4.00	\$7.00	\$10.00

## IMPROVED DOUBLE HOSE CLAMPS (Not Illustrated).

Size of hose, in inches—3 ply . . . . .	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Fig. 86, per dozen . . . . .	\$1.50	\$1.50	\$2.00	\$2.50	\$3.00	\$4.00	\$7.00	\$10.00



FIG. 58.

## BRASS HOSE STRAPS.

No.	Hose.	Long.	Per Doz.	No.	Hose.	Long.	Per Doz.
2	$\frac{1}{2}$ in.	$3\frac{1}{2}$ in.	\$0.40	10	1 in.	5 in.	\$0.80
4	$\frac{1}{2}$ "	$3\frac{1}{2}$ "	.40	12	1 "	5 "	.80
6	$\frac{3}{4}$ "	$4\frac{1}{2}$ "	.60	14	$1\frac{1}{4}$ "	6 "	1.00
8	$\frac{3}{4}$ "	$4\frac{1}{2}$ "	.60	16	$1\frac{1}{4}$ "	6 "	1.00

# HOSE SPANNERS OR WRENCHES.

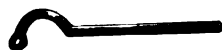


FIG. 87.

Size, Inches . . . . .	1¼	1½	2	2½
Fig. 87. Single-end, per doz. .	\$3.50	\$3.50	\$4.00	\$4.50
Size, Inches . . . . .	1¼ x 1½	1½ x 2	2 x 2½	
Fig. 88. Double-end, per doz. .	\$5.25	\$6.00	\$6.75	



FIG. 88.



FIG. 89.

## BRASS HOSE NIPPLES.

Size, Inches . . . . .	¼	¾	1	1¼	1½	2	2½	3
Fig. 89, per doz. . . . .	\$3.50	\$3.50	\$5.00	\$9.00	\$10.00	\$14.00	\$28.00	\$40.00
Fig. 90, " . . . . .	3.50	3.50	5.00	9.00	10.00	14.00	28.00	40.00



FIG. 90.



FIG. 799.

## BRASS HOSE REDUCERS.

Size, Inches . . . . .	1 to ¾	1¼ to 1	1½ to ¾	1½ to 1	1½ to 1¼	2 to ¾	2 to 1	2 to 1½	2½ to 1½	2½ to 1	2½ to 1¼	2½ to 1½	2½ to 2
Price . . . . .	\$0.60	\$0.75	\$0.85	\$0.95	\$1.10	\$1.25	\$1.50	\$1.60	\$2.10	\$2.10	\$2.10	\$2.25	\$2.35



FIG. 784.

## BRASS HOSE CAPS.

Size, Inches, ¼ 1 1¼ 1½ 2 2½						
Price . . .	\$0.75	\$1.00	\$1.50	\$2.00	\$2.50	\$3.00

## BRASS HOSE PIPE SPRINKLERS.

Dia. of Face, Inches . .	1½	1¾	2¾	2¾	2¾
Size Hose Pipe . . .	¾	1	1¼	1½	2
Price, per doz. . . . .	\$3.50	\$3.50	\$6.00	\$6.00	\$9.00



FIG. 503.



FIG. 622.

## GLOBE SUCTION BASKET—TO TIE ON.

Size, Inches . . . . .	¼	¾	1	1¼	1½	2	2½
Galvanized Iron . . . . .	\$0.40	\$0.45	\$0.50	\$0.60	\$0.75	\$1.25	\$1.90
Brass . . . . .	1.50	1.75	2.00	2.25	2.75	3.50	5.00

## BRASS SUCTION BASKETS.

FIG. 750. To tie on.

Size, inches . . .	¾	1	1¼	1½	2
Price . . . . .	\$2.50	\$3.00	\$3.25	\$4.00	\$5.00

FIG. 751. To screw on.

Size, inches . . .	1½	2	2½	2½	3	3½	4
Price . . . . .	\$4.00	\$5.00	\$6.00	\$7.00	\$10.00	\$15.00	\$20.00

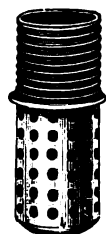


FIG. 750.

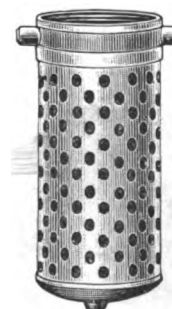


FIG. 751.



FIG. 357.

## "GEM" GRADUATING SPRAY PIPE.

Size, inches . . . . .	$\frac{3}{4}$	1
Per doz. . . . .	\$10.00	\$12.00



FIG. 66.

## "HOSFORD" HOSE PIPE.

Size, inches . . . . .	$\frac{3}{4}$	1
Per doz. . . . .	\$6.00	\$7.50



FIG. 502.

## HOSE NOZZLE, TO TIE ON.

Size, inches . . . . .	$\frac{3}{4} \times 3\frac{1}{2}$	1 x 4	$1\frac{1}{4} \times 4\frac{1}{2}$
Per doz. . . . .	\$3.50	\$4.00	\$6.50



FIG. 499.

## HOSE PIPE SCREW TIP.

Size, inches . . . . .	$\frac{3}{4} \times 6$	1 x $7\frac{1}{4}$	1 x 12
Per doz. . . . .	\$8.00	\$9.00	\$12.00



FIG. 496.

## LARGE HOSE PIPE, SCREW TIP.

Size, inches . . . . .	$1\frac{1}{4} \times 12\frac{1}{4}$	$1\frac{1}{4} \times 18$	2 x 20	$2\frac{1}{2} \times 15$
Per doz. . . . .	\$21.00	\$36.00	\$50.00	\$75.00

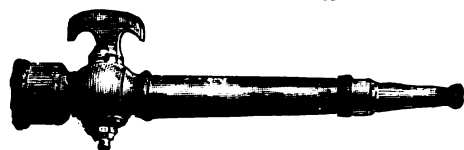


FIG. 501.

## HOSE PIPE WITH COCK ON END, SCREW TIP.

Size, inches, . . . . .	$\frac{3}{4} \times 8$	$\frac{3}{4} \times 12$	1 x 12	$1\frac{1}{4} \times 12$	$1\frac{1}{2} \times 12\frac{1}{4}$	2 x 30
Per doz. . . . .	\$13.00	\$18.00	\$20.00	\$40.00	\$55.00	\$136.00



FIG. 91.

## UNDERWRITERS HOSE PIPE.

2 $\frac{1}{2}$ in. butt, 30 in. long, wound and painted, with swivel handle and screw Tip . . . . .	\$10.00
--	---------



Iron.



## WATER RELIEF VALVES.

Brass.



Fig. 34. Size.	Diameter of Base Flange.	Diameter of Side Outlet.	Brass.	Iron.
1 in.	Screwed	1 in.	\$12.00	
1 1/4 "	"	1 1/4 "	15.00	
1 1/2 "	"	1 1/2 "	20.00	
2 "	"	2 "	40.00	\$30.00
2 1/2 "	"	2 1/2 "	62.00	50.00
3 "	Screwed or 9 in. Flange.	3 "	80.00	65.00
3 1/2 "	" 10 "	3 1/2 "		80.00
4 "	" 11 "	4 "		100.00
5 "	" 12 "	9 "		150.00
6 "	" 14 "	10 "		180.00

In ordering state pressure to be carried.

## LEVER SAFETY VALVE.

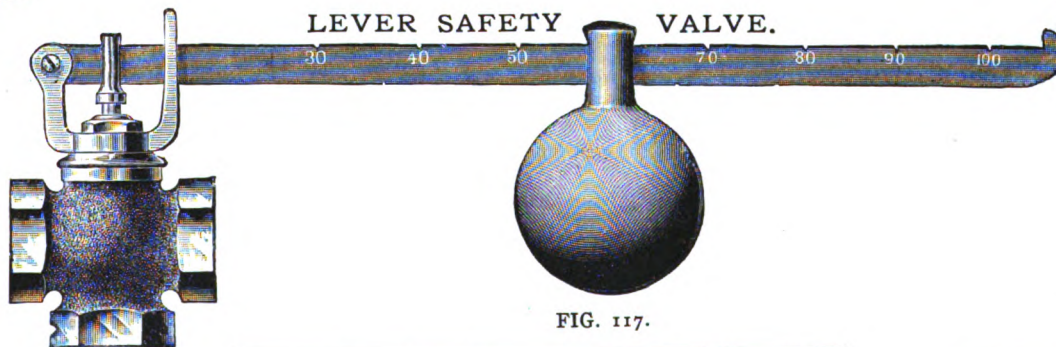


FIG. 117.

Size, Inches.	1 1/4	1 1/2	2	2 1/2	3	4	5	6
Iron Body, Globe or Angle.	\$5.00	\$6.00	\$8.00	\$13.00	\$18.00	\$30.00	\$44.00	\$60.00
Brass Body, Globe or Angle.	7.00	8.50	12.00	20.00	30.00			

## PRESSURE AND VACUUM GAUGES.

Size Dial, Inches.	2 1/2 or 3 in.	3 1/2	4 1/2	5	5 1/2	6
Figs. 30 and 30 1/2, Iron Body, Brass Ring.	\$6.00	\$7.00	\$8.00	\$8.00	\$10.00	\$13.00
Figs. 30 and 30 1/2 Brass Case.	8.00	9.00	10.00	11.00	12.00	16.00

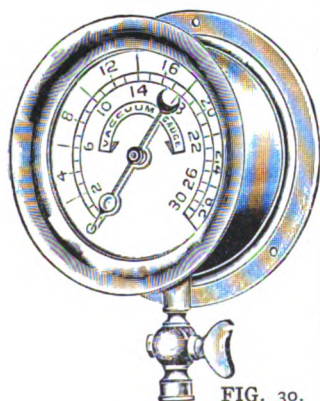


FIG. 30.

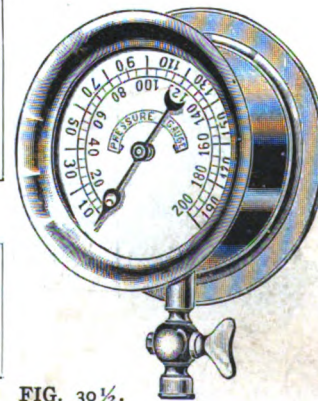
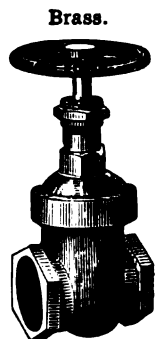


FIG. 30 1/2.

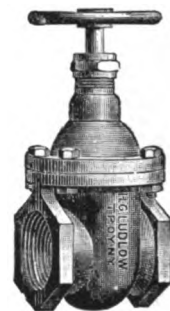
## SINGLE AND DOUBLE GATE VALVES.



Brass.

Size. Inches.	Fig. 1, Single Gate, All Iron.	Fig. 1, Single Gate, Iron Body, Brass Mounted.	Fig. 2, Double Gate, All Iron.	Fig. 2, Double Gate, Iron Body, Brass Mounted.	Fig. 2, Double Gate, All Brass.	Extra for Slide Stem and Lever.
1	...	...	\$4.75	\$5.00	\$2.35	\$0.80
1½	...	...	5.25	5.50	3.40	1.00
1½	\$5.00	\$5.00	5.75	6.00	4.40	1.00
2	6.00	6.00	6.25	7.00	6.25	1.25
2½	8.25	8.75	8.75	10.25	13.75	1.75
3	9.50	11.00	10.00	12.25	15.50	2.00
3½	13.25	15.00	14.00	16.50	23.50	2.00
4	13.50	16.25	15.00	18.00	34.00	2.00
5	21.50	23.75	23.00	25.00	52.00	2.25
6	25.50	28.00	27.00	30.50	76.00	2.25

Iron,  
Brass Mounted.



Quick Moving Slide  
Stem and  
Lever Valve.

Brass Hose Valve,  
Double Gate, with  
Cap and Chain.

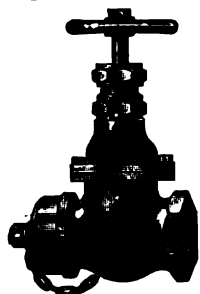


FIG. 3.

## BRASS HOSE VALVES.

Size. Inches.	FIG. 3. DOUBLE GATE.		FIG. 4. SINGLE GATE.	
	With Cap and Chain.	Without Cap and Chain.	With Loose Coupling.	Without Loose Coupling.
1½	\$7.00	\$6.00	...	...
2	9.25	7.75	...	...
2½	14.50	13.00	\$12.50	\$10.00
2½	Heavy Pattern.		13.75	10.50

Brass Hose Valve,  
Single Gate, with  
Swivel Coupling  
and Male End.

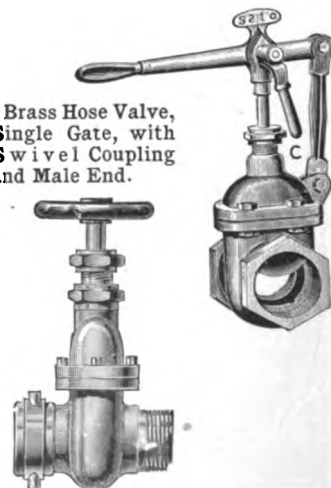


FIG. 4.

# BRASS GLOBE, GATE VALVES, ETC.

Jenkins' Disk.

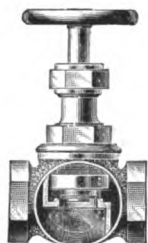


FIG. 5.

Globe.

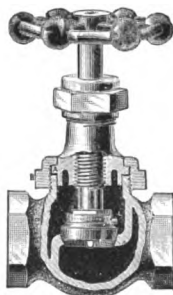


FIG. 6.

Horizontal Check.

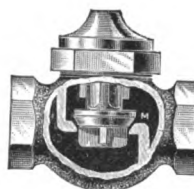


FIG. 28.

Straight Way.



FIG. 7.

Size, Inches.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Fig. 6	\$0.70	\$0.85	\$1.15	\$1.45	\$2.00	\$2.80	\$3.90	\$6.20	\$12.00	\$16.50
" 7	1.00	1.20	1.75	2.50	3.50	5.00	7.50	14.00	19.50	22.00
" 5	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.00	15.75	22.00
" 28			1.60	2.15	3.10	4.40	6.25	9.50	16.00	25.00

Handy Gate Valve.

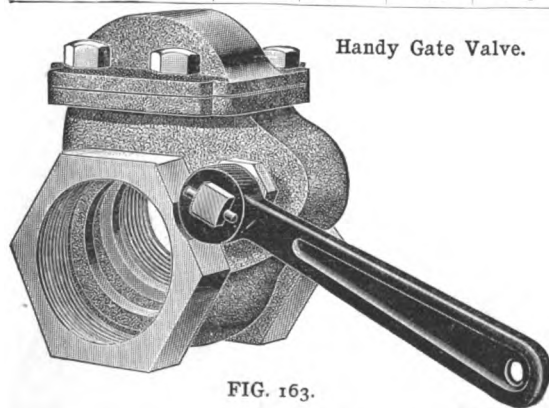


FIG. 163.

Lever Throttle Valve.

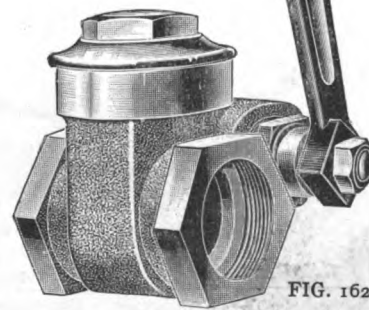


FIG. 162.

Size, Inches.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Fig. 163, Brass Body	\$1.60	\$1.80	\$2.50	\$3.50	\$5.00	\$7.50	\$13.50	\$19.00		\$60.00			
" " Iron Body, Brass Trimmings,						9.00	12.00	15.00	\$18.00	21.00	\$25.00	\$30.00	\$35.00
" 162, Brass		3.00	4.00	5.00	7.00	10.00	19.00	20.00	25.00	30.00		35.00	40.00
" " Iron, Brass Mounted							16.00						

# BRASS GLOBE, ANGLE VALVES, ETC.

Globe Valve.

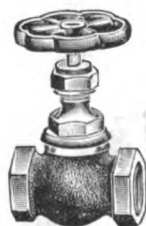


FIG. 753.

Globe Valve.



FIG. 98.

Globe Valve.



FIG. 100.

Angle Valve.



FIG. 567.

Angle Valve.



FIG. 99.

Angle Valve.

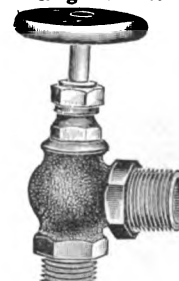


FIG. 101.

Size, Inches.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Fig. 753, Rough . . . .	\$0.60	\$0.75	\$1.00	\$1.35	\$1.80	\$2.80	\$3.90	\$5.90	\$11.25	\$16.00
" 98, " . . . .	. . .	. . .	1.15	1.60	2.15	3.35	5.00	7.25	13.00	18.50
" 100, " . . . .	.80	.95	1.30	1.80	2.45	3.85	6.00	8.50	14.75	21.00
" 567, " . . . .	.60	.75	1.00	1.35	1.80	2.80	3.90	5.90	11.25	16.00
" 99, " . . . .	. . .	. . .	1.15	1.60	2.15	3.35	5.00	7.25	13.00	18.50
" 101, " . . . .	.80	.95	1.30	1.80	2.45	3.85	6.00	8.50	14.75	21.00

Cross Valve.

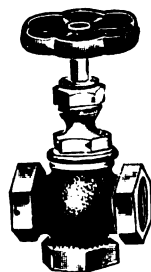


FIG. 568.

Globe Valve.

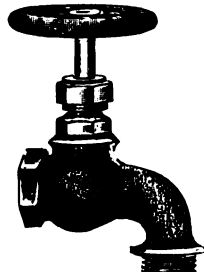


FIG. 102.

Angle Valve.

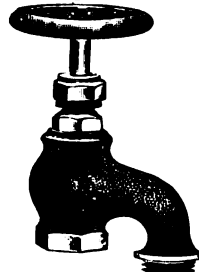


FIG. 103.

Garden Hose Valve.



FIG. 104.

Garden Hose Valve.

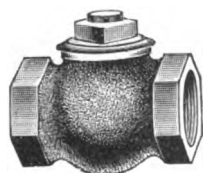


FIG. 105.

Size, Inches.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Fig. 568, Rough . . . .	\$0.85	\$1.00	\$1.50	\$2.00	\$2.50	\$3.50	\$5.00	\$8.00	\$16.00	\$24.00
" 102, " . . . .	. . .	. . .	1.50	1.75	2.75	3.75	5.00	8.00	14.00	24.00
" 103, " . . . .	. . .	. . .	1.50	1.75	2.75	3.75	5.00	8.00	14.00	24.00
" 104, " . . . .	. . .	. . .	. . .	. . .	3.25	4.00	5.50	7.00	10.00	. . .
" 105, " . . . .	. . .	. . .	1.25	1.65	2.20	3.40	4.90	7.20	. . .	. . .

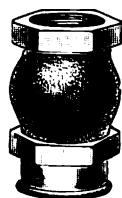
# BRASS CHECK VALVES, STOPS, ETC.

**HORIZONTAL CHECK VALVE.**



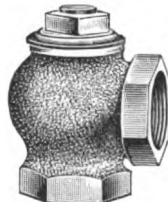
**FIG. 752.**

**VERTICAL CHECK VALVE.**



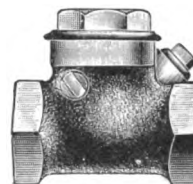
**FIG. 572.**

**ANGLE CHECK VALVE.**



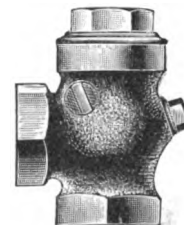
**FIG. 106.**

**HORIZONTAL SWINGING CHECK VALVE.**



**FIG. 107.**

**ANGLE SWINGING CHECK VALVE.**



**FIG. 108.**

SIZE, INCHES.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Fig. 752, rough.	\$0.50	\$0.60	\$0.85	\$1.15	\$1.55	\$2.30	\$3.25	\$5.20	\$10.00	\$14.00
" 572, "	.50	.60	.85	1.15	1.55	2.30	3.25	5.20	10.00	14.00
" 106, "	.50	.60	.85	1.15	1.55	2.30	3.25	5.20	10.00	14.00
" 107, "	1.25	1.25	1.30	1.75	2.25	3.25	4.25	6.25	11.50	16.00
" 108, "	. . .	. . .	1.30	1.75	2.25	3.25	4.25	6.25	. . .	. . .

**ROUGH STOP, TEE HANDLE.**



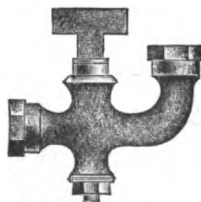
**FIG. 408.**

**BALL COCK.**



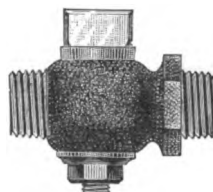
**FIG. 115.**

**HYDRANT COCK. Check and Waste.**



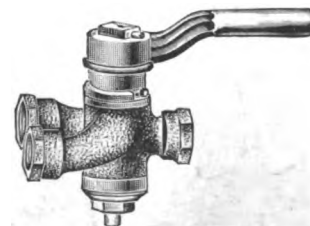
**FIG. 754.**

**CORPORATION STOP COCK**



**FIG. 12.**

**RAIN AND WELL WATER COCK.**



**FIG. 116.**

SIZE, INCHES.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Fig. 408, rough, per dozen.	\$8.00	\$10.00	\$13.00	\$21.00	\$31.00	\$50.00	\$70.00	\$120.00
" 115, " " "	. . .	11.00	13.00	21.50	33.00	54.00	96.00	144.00
" 754, " " "	. . .	. . .	15.00	23.00	36.00	60.00	108.00	180.00
" 12, " " "	. . .	13.00	16.00	29.00	46.00	90.00	. . .	. . .
" 116, " " "	. . .	. . .	. . .	56.00	79.00	96.00	138.00	230.00

# BRASS STEAM COCKS.

SQUARE HEAD.

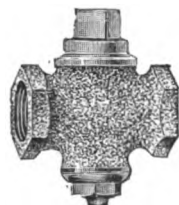


FIG. 725.

TEE HANDLE.



FIG. 131.

FLAT HEAD.

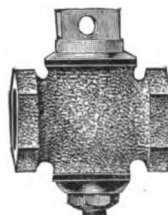


FIG. 132.

SQUARE HEAD

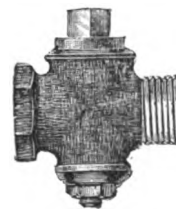


FIG. 133.

THREE WAY.



FIG. 726.

Size, inches.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Fig. 725, 131, 132, rough.	\$0.70	\$0.75	\$1.00	\$1.50	\$2.25	\$3.75	\$4.80	\$7.25	\$14.00	\$20.00
" 133	.80	.85	1.20	1.70	2.55	4.15	5.40	8.00	15.50	22.00
" 726			1.65	2.25	3.40	5.50	7.00	10.00	18.00	26.00

# BRASS SERVICE AND METER COCKS.

SQUARE HEAD.



FIG. 134.

TEE HANDLE.



FIG. 135.

FLAT HEAD.



FIG. 727.

SQUARE HEAD.

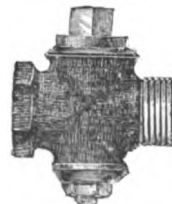


FIG. 136.

FLAT HEAD.

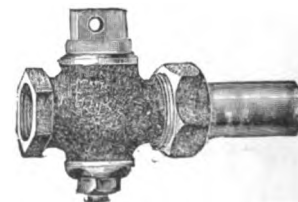


FIG. 137.

Size, inches.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Fig. 134, rough.	\$0.55	\$0.65	\$0.75	\$1.00	\$1.40	\$2.20	\$3.00	\$5.00	\$10.00	\$15.00
" 135	.55	.65	.75	1.00	1.40	2.20	3.00	5.00	10.00	15.00
" 727	.55	.65	.75	1.00	1.40	2.20	3.00	5.00	10.00	15.00
" 136	.65	.75	.85	1.20	1.70	2.60	3.60	5.75	11.50	17.00
" 137	.75	.90	1.00	1.30	2.00	3.00	4.25	6.75		

## BRASS BIBBS, STOPS, ETC.

Plain Bibb for  
Lead Pipe.

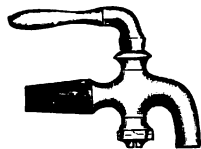


FIG. 109.

Plain Bibb for  
Iron Pipe.



FIG. 573.

Hose Bibb for  
Lead Pipe.

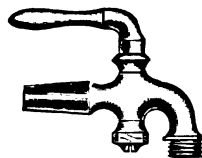


FIG. 110.

Hose Bibb for  
Iron Pipe.

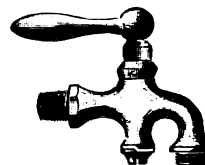


FIG. 724.

Stop for Iron  
Pipe.



FIG. 575.

Size, Inches.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Fig. 109, Rough, per Dozen . . .	\$9.00	\$11.00	\$14.00	\$16.00	\$21.00	\$32.00	\$52.00	\$72.00	\$150.00
" 109, Finished, " . . .	10.00	12.00	15.00	18.00	24.00	36.00	60.00	84.00	170.00
" 573, Rough, " . . .	10.00	12.00	15.00	17.00	23.00	35.00	56.00	78.00	160.00
" 573, Finished, " . . .	11.00	13.00	16.00	19.00	26.00	39.00	64.00	90.00	180.00
" 110, Rough, " . . .	. . .	. . .	15.00	17.00	23.00	35.00	56.64	78.00	160.00
" 110, Finished, " . . .	. . .	. . .	16.00	19.00	26.00	39.00	64.00	90.00	180.00
" 724, Rough, " . . .	. . .	. . .	16.00	18.00	25.00	38.00	68.00	84.00	170.00
" 724, Finished, " . . .	. . .	. . .	17.00	20.00	28.00	42.00	60.00	96.00	190.00
" 575, Rough, " . . .	8.00	10.00	13.00	17.00	21.00	31.00	50.00	70.00	120.00
" 575, Finished, " . . .	. . .	. . .	13.00	. . .	21.00	31.00	50.00	70.00	120.00

Compression Bibb for  
Lead Pipe.

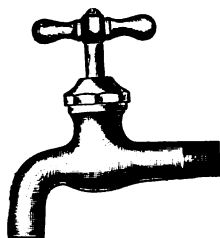


FIG. 111.

Compression Hose Bibb  
for Lead Pipe.

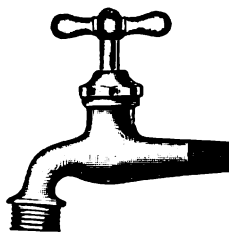


FIG. 112.

Compression Bibb  
for Iron Pipe.



FIG. 723.

Compression Hose  
Bibb for Iron Pipe.



FIG. 574.

Compression  
Stop for  
Iron Pipe.



FIG. 114.

Size, Inches.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Fig. 111, Rough, per Dozen	\$8.50	\$9.50	\$11.00	\$17.00	\$30.00	\$44.00	\$68.00	\$140.00
" 111, Finished, "	9.00	10.00	12.00	18.00	34.00	52.00	80.00	160.00
" 112, Rough, "	9.50	10.50	12.00	19.00	33.00	48.00	74.00	150.00
" 112, Finished, "	10.00	11.00	13.00	20.00	37.00	56.00	86.00	170.00
" 723, Rough, "	9.50	10.50	12.00	19.00	33.00	48.00	74.00	150.00
" 723, Finished, "	10.00	11.00	13.00	20.00	37.00	56.00	86.00	170.00
" 574, Rough, "	...	11.50	13.00	21.00	36.00	52.00	80.00	160.00
" 574, Finished, "	...	12.00	14.00	22.00	40.00	60.00	92.00	180.00
" 114, Rough, "	10.50	11.50	14.00	20.50	35.00	52.00	90.00	...
" 114, Finished, "	11.00	12.00	15.00	21.50	39.00	60.00	102.00	...

# BRASS OIL CUPS, AIR AND CYLINDER COCKS.

Plain.

Hinge Lid.

Tee Handle.

Tee Handle.

Bibb, Tee Handle.



FIG. 119.



FIG. 120.

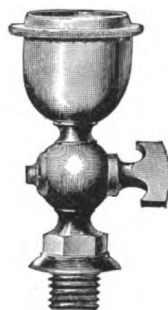


FIG. 122.

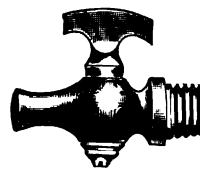


FIG. 124.

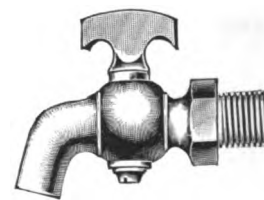


FIG. 125.

No. . . . .	00	0	0½	1	1½	2	3	4	5	6
Diameter Body, Inches,	⅝	¾	⅞	1	1½	1¾	1½	1¾	2	2¼
Threaded for Iron Pipe,	⅜	⅜	⅜	¼	¼	¾	¾	½	½	½
Fig. 119 . . . . .	\$0.25	\$0.30	\$0.35	\$0.40	\$0.50	\$0.60	\$0.90	\$1.25	\$1.75	\$2.25
" 120 . . . . .			.85	1.20	1.60	1.60	2.70	3.25		
" 122 . . . . .				1.35		1.60	2.20			4.00

Size, Inches.	⅝	¾	⅞	1
Fig. 124 . . .	\$0.40	\$0.45	\$0.50	\$0.60
" 125 . . .	.65	.70	.75	.85

## PLAIN BRASS LUBRICATOR.

FIG. 128. SIZES, PRICES, ETC.



FIG. 128.

Diameter Body, Inches,	1	1½	1½	1¾	2	2½	2½	3	3½
Threaded for Iron Pipe,	¾	¾	¾	¾	¾	¾	¾	¾	¾
Each . . . . .	\$2.00	\$2.20	\$2.40	\$2.60	\$2.90	\$3.25	\$3.75	\$4.75	\$7.00

## BRASS STOP AND SIGHT FEED OILER.

FIG. 130. SIZES, PRICES, ETC.

No.	Capacity.	Height.	Width.	Shank.	Price per Doz.
4	1 oz.	4¼ in.	1¾ in.	¼ in.	\$18.00
5	1½ "	5 "	1¾ "	¾ "	21.00
6	2 "	5½ "	2½ "	¾ "	24.00
7	4 "	5¾ "	2½ "	¾ "	27.00
8	6 "	6¼ "	2½ "	¾ "	32.00
9	10 "	7¼ "	3½ "	1½ "	40.00
10	15 "	7¾ "	3½ "	1½ "	54.00
11	24 "	8¼ "	4½ "	1½ "	84.00
12	36 "	9¼ "	4½ "	1½ "	120.00



FIG. 130.



## COMMON PIPE TONGS.



FIG. 373.

Pipe, inches .	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, each .	\$0.60	\$0.65	\$0.70	\$0.75	\$0.90	\$1.10	\$1.30
Pipe, inches .	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5
Price, each .	\$1.50	\$1.90	\$2.50	\$4.25	\$4.50	\$5.00	\$8.00

## BROWN'S ADJUSTABLE TONGS.

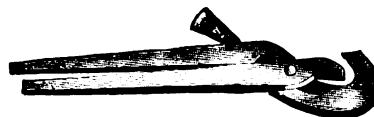


FIG. 377.

Number . . . . .	1	$1\frac{1}{2}$	2	3	4	5	6
Takes Pipe from, Inches	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{3}{8}$ to 1	$\frac{1}{4}$ to $1\frac{1}{4}$	1 to 2	$1\frac{1}{2}$ to 3	$2\frac{1}{2}$ to 4	3 to 5
Price, each . . . . .	\$1.30	\$1.65	\$2.00	\$3.00	\$6.00	\$11.00	\$25.00

## ROBBIN'S CHAIN TONGS.



FIG. 755.

Number . . . . .	2	3	4	5	6	7
Takes Pipe from, In.	1 to 2	$1\frac{1}{4}$ to 4	2 to 6	$2\frac{1}{2}$ to 8	4 to 10	4 to 16
Price, each . . . . .	\$5.50	\$6.25	\$9.00	\$12.50	\$16.00	\$30.00

## BROCK'S CHAIN TONGS.



FIG. 370.

Number . . . . .	0	1	2	3	4	5
Takes Pipe from, In.	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{4}$ to $1\frac{1}{4}$	$\frac{1}{4}$ to $2\frac{1}{2}$	$\frac{3}{4}$ to 4	1 to 8	2 to 14
Price, each . . . . .	\$2.50	\$3.50	\$5.50	\$7.50	\$11.00	\$18.00
Extra Chains, each .	.75	1.00	1.50	2.50	4.00	6.00
Extra Jaws, pair . .	1.00	1.75	2.75	4.00	5.00	7.50

## ALLIGATOR WRENCHES.



FIG. 782.

Number . . . . .	1	2	3	4	5
Takes Pipe from, In.	$\frac{1}{2}$ to $\frac{3}{4}$	$\frac{3}{4}$ to $\frac{1}{2}$	$\frac{1}{2}$ to $1\frac{1}{4}$	$1\frac{1}{4}$ to 2	2 to 3
Price, per dozen . .	\$4.00	\$12.00	\$24.00	\$36.00	\$54.00

## ENGINEERS' WRENCHES.



FIG. 375.

Inches . . . . .	6	8	10	12	15	18	21
Price, per dozen.	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00

## STILLSON'S PIPE WRENCH.



FIG. 362.

Length open, Inches . .	6	8	10	14	18	24	36	48
Takes Wire from, In. . .	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	1
" Pipe to, Inches . . .	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$3\frac{1}{2}$	5
Price, each . . . . .	\$2.00	\$2.00	\$2.25	\$3.00	\$4.00	\$6.00	\$12.00	\$18.00
Extra Frames, each . . .	.25	.25	.33	.45	.55	.65	.75	1.00
" Nuts, each . . . . .	.20	.20	.27	.35	.42	.50	.65	.80
" Jaws, " . . . . .	.67	.67	.75	1.00	1.33	2.00	4.00	6.00

## BAXTER'S ADJUSTABLE WRENCH.



FIG. 756.

Size, Inches . . . . .	4	6	8	10	12
Price, each . . . . .	\$0.50	\$0.75	\$1.00	\$1.50	\$2.00

## SAUNDERS' PIPE CUTTER.



FIG. 316.

No. . . . .	1	2	3
Cuts Pipe from, Inches . . . . .	$\frac{1}{2}$ to 1	1 to 2	2 to 3
Price, each . . . . .	\$3.00	\$4.50	\$14.00
" extra Blocks and Wheels . . . . .	1.25	1.75	3.25
" " Wheels, each . . . . .	.24	.32	.60
" " Rollers, " . . . . .	.24	.32	.50

## COMBINATION PIPE WRENCH.

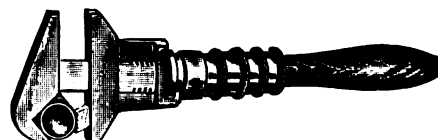


FIG. 305.

10 in., for pipe, from $\frac{1}{2}$ to 1 in., per doz.,	\$25.25
12 " " $\frac{1}{2}$ to $1\frac{1}{4}$ " " "	28.50
15 " " $\frac{1}{2}$ to 2 " " "	40.50

## KIRK'S PIPE WRENCH.

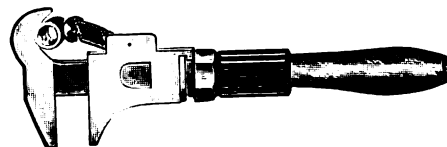


FIG. 307.

Size, Inches . . . . .	12	15	18	21
Price, per dozen . . . . .	\$34.50	\$48.00	\$79.50	\$93.00
Extra Pawls, each . . . . .	.42	.50	.58	.58
" Cutter Wheels, each . . . . .	.21	.25	.29	.29

## BARNES' PIPE CUTTER.



FIG. 317.

No. . . . .	1	2	3	4	5
Cuts Pipe from, Inches . . . . .	$\frac{1}{2}$ to 1	$\frac{1}{2}$ to 2	$1\frac{1}{2}$ to 3	3 to 4	4 to 6
Price, each . . . . .	\$4.50	\$6.00	\$10.00	\$20.00	\$30.00
" extra Wheels, each . . . . .	.25	.30	.40	.50	.75
" " Wheel Pins, each . . . . .	.10	.10	.10	.18	.18

## GAS PIPE STOCK AND DIE.



FIG. 372.

No.	0	1	1½	1¾	With Leader Screw.	
					2	3
Dies furnished with each plate.	¼ to ½	¾ to 1	¾ to 1¼	1 to 1¼	1¼ to 2	2½ and 3
Dimensions of Dies . . . .	2 x ¼	2½ x ¾	3 x ¾	3 x ¾	4 x ¾	5 x 1¼
Complete with R. H. Dies . .	\$9.50	\$15.00	\$13.50	\$13.50	\$20.00	\$43.00
Plates, without Dies . . . .	3.50	5.00	6.00	6.00	9.50	25.00
Extra Dies, R. or L. . . . .	1.50	2.00	2.50	2.50	3.50	9.00
Extra Bushings . . . . .	.25	.35	.45	.45	.60	1.00
Extra Die Frames . . . . .	. . .	.35	.40	.45	.50	.60

## DIE PLATES.

HILL'S PATENT DIES.



FIG. 310.

No.	0	1	1½	1¾	With Leader Screw.	
					2	3
Dies furnished with each plate	¼ to ½	¾ to 1	¾ to 1¼	1 to 1¼	1¼ to 2	2½ and 3
Dimensions of Dies . . . .	2 x ¼	2½ x ¾	3 x ¾	3 x ¾	4 x ¾	5 x 1¼
Plates complete, with R. H. Dies . .	\$9.50	\$15.00	\$13.50	\$13.50	\$20.00	\$43.00
Plates, without Dies . . . .	3.50	5.00	6.00	6.00	9.50	25.00
Extra Dies, R. or L. . . . .	1.50	2.00	2.50	2.50	3.50	9.00
Extra Bushings . . . . .	.25	.35	.45	.45	.60	1.00
Extra Die Frames . . . . .	. . .	.30	.40	.40	.50	.60



FIG. 311.

## GAS PIPE TAPS AND REAMERS.



FIG. 312.

SIZE, INCHES.	¼	¾	¾	¾	¾	1	1¼	1½	2	2½	3
Taps, each . . . .	\$1.12	\$1.25	\$1.50	\$1.87	\$2.50	\$3.12	\$3.75	\$4.62	\$6.25	\$10.50	\$15.00
Reamers, each . .	1.12	1.25	1.50	1.87	2.50	3.12	3.75	4.62	6.25	10.50	15.00
Drills, each . . .	1.35	1.35	1.80	2.35	2.80	3.20	3.80	4.60	5.50	. . .	. . .

## COMBINED DRILL, REAMER AND TAP.



FIG. 313.

SIZE, INCHES.	¼	¾	¾	¾	1	1¼	1½	2
Price . . . . .	\$2.50	\$2.50	\$3.00	\$4.50	\$6.00	\$7.25	\$8.50	\$10.75

# PUMP STOCK AND DIE.



FIG. 757.

Size Inches . . .	$\frac{3}{8}$ x 14	7-16 x 12	$\frac{1}{2}$ x 12
Price, each . . .	\$2.50	\$2.50	\$2.50

LIGHTNING DIE AND HOLDER, SINGLE.

LIGHTNING DIE AND HOLDER, DOUBLE.



FIG. 314.



FIG. 315.

Single Stock, with $\frac{3}{8}$ x 14 Die, Complete . . . . .	\$1.70
" " 7-16 x 12 " . . . . .	1.90
" " $\frac{1}{2}$ x 12 " . . . . .	2.20
Dies only, $\frac{3}{8}$ x 14 . \$1.15 7-16 x 12 . \$1.30 $\frac{1}{2}$ x 12 . 1.50	

Double Stock, with one Die each $\frac{3}{8}$ x 14 and 7-16 x 12, Complete. . . . .	3.00
Dies only, $\frac{3}{8}$ x 14, each . . . . .	1.00
" 7-16 x 12 " . . . . .	1.15

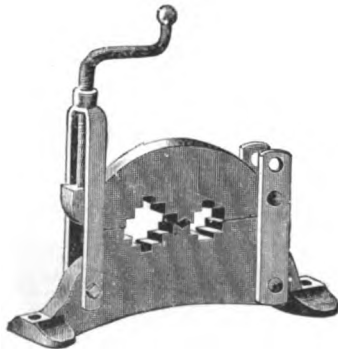


FIG. 374.

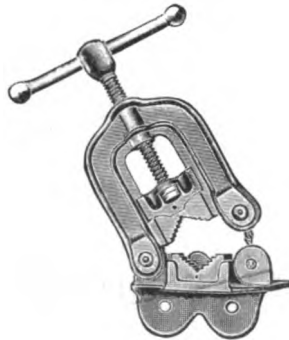


FIG. 308.

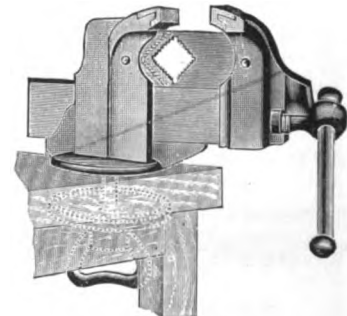


FIG. 732.

MALLEABLE HINGE VISE.

SMITH'S COMBINATION BENCH VISE.

FIG. 308.

FIG. 732.

No. 1, $\frac{1}{2}$ to 2 inch . . . . .	\$10.00
" 2, $\frac{1}{4}$ " 3 " . . . . .	14.00

No. 1, $\frac{1}{2}$ to 2 inch . . . . .	\$16.00
" 2, $\frac{1}{4}$ " 3 " . . . . .	20.00
" 3, $\frac{1}{4}$ " 4 " . . . . .	25.00

ENTERPRISE PIPE VISE.

HOWARD'S COMBINATION BENCH VISE.

FIG. 374.

FIG. 211.

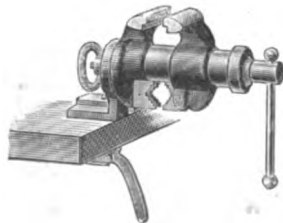


FIG. 211.

For $\frac{1}{2}$ to 2 inch Pipe . . . . .	\$3.00
--	--------

For $\frac{1}{2}$ to 3 inch Pipe . . . . .	\$15.00
--	---------

## USEFUL INFORMATION—WATER.

Doubling the diameter of a pipe increases its capacity four times. Friction of liquids in pipes increases as the square of the velocity.

The mean pressure of the atmosphere is usually estimated at 14.7 lbs. per square inch, so that with a perfect vacuum it will sustain a column of mercury 29.9 inches, or a column of water 33.9 feet high.

*To find the pressure in pounds per square inch of a column of water:* Multiply the height of the column in feet by .434. Approximately, we say, that every foot elevation is equal to  $\frac{1}{2}$  lb. pressure per square inch; this allows for ordinary friction.

*To find the diameter of a pump cylinder* to move a given quantity of water per minute (100 feet of piston being the standard of speed): Divide the number of gallons by 4, then extract the square root, and the product will be the diameter in inches of the pump cylinder.

*To find quantity of water* elevated in one minute running at 100 feet of piston speed per minute: Square the diameter of the water cylinder in inches and multiply by 4. Example: Capacity of a 5-inch cylinder is desired. The square of the diameter (5 inches) is 25, which multiplied by 4 gives 100, the number of gallons per minute (approximately).

*To find the capacity of a cylinder* in gallons: Multiplying the area in inches by the length of stroke in inches will give the total number of cubic inches; divide this amount by 231 (which is the cubical contents of a U. S. gallon in inches) and product is the capacity in gallons.

The capacity per minute will be determined by multiplying this product by number of strokes cylinder is working per minute.

*To find the horse power* necessary to elevate water to a given height: Multiply the number of gallons per minute by 8.35 (weight of one gallon), and this result by total number of feet water is raised (that is, from surface of the water to the highest point to which the water is raised), and you have the power in foot pounds. Divide by 33,000 and you have the horse power. One horse power is equal to about five men. To the theoretical power a liberal allowance for friction, etc., always wants to be added.

## USEFUL INFORMATION—STEAM.

A good automatic non-condensing engine requires from 3 to 4 pounds of coal per horse power per hour, according to the quality of the coal.

An automatic condensing engine requires from  $2\frac{1}{4}$  to  $3\frac{1}{2}$  pounds of coal per horse power per hour.

A steam-jacketed compound condensing engine of the most improved construction may reduce the consumption of coal as low as  $1\frac{3}{4}$  to 2 pounds of coal per horse power per hour.

The average amount of feed-water required for a good, economical engine is 30 pounds per indicated horse power per hour; engines of high economy will use less than this amount, and those more wasteful will use more. A high piston speed, together with a high rotative speed, is very desirable, as great power may thus be obtained from moderate-sized engines, and also the evil of internal condensation is corrected to a great extent, but these are somewhat limited by practical considerations.

A good condenser increases the economical efficiency of an engine from 25 to 40 per centum, and the amount of injection water required is about 25 times the quantity fed into the boilers.

# BAROMETRIC PRESSURES AT DIFFERENT ALTITUDES.

WITH EQUIVALENT HEAD OF WATER AND THE VERTICAL SUCTION LIFT OF PUMPS.

Altitude.	Barometric Pressure.	Equiv. Head of Water.	Practical Suction Lift of Pumps.	Altitude.
Sea Level	14.70 lbs. per sq. in.	33.95 ft.	25 ft.	Sea Level
$\frac{1}{4}$ mile (1320 ft.) above sea level.	14.02 " "	32.38 " "	24 " "	$\frac{1}{4}$ mile (1320 ft.) above sea level.
$\frac{1}{2}$ " (2640 ft.) " " "	13.33 " "	30.79 " "	23 " "	$\frac{1}{2}$ " (2640 ft.) " " "
$\frac{3}{4}$ " (3960 ft.) " " "	12.66 " "	29.24 " "	21 " "	$\frac{3}{4}$ " (3960 ft.) " " "
1 " (5280 ft.) " " "	12.02 " "	27.76 " "	20 " "	1 " (5280 ft.) " " "
$1\frac{1}{4}$ " (6600 ft.) " " "	11.42 " "	26.38 " "	19 " "	$1\frac{1}{4}$ " (6600 ft.) " " "
$1\frac{1}{2}$ " (7920 ft.) " " "	10.88 " "	25.13 " "	18 " "	$1\frac{1}{2}$ " (7920 ft.) " " "
2 " (10560 ft.) " " "	9.88 " "	22.82 " "	17 " "	2 " (10560 ft.) " " "

## WEIGHT AND CAPACITY OF DIFFERENT STANDARD GALLONS OF WATER.

	Cubic Inches in a Gallon.	Weight of a Gallon in Pounds.	Gallons in a Cubic Foot.	Weight of a Cubic Foot of Water, English Standard, 62.321 lbs. Avolrdupois.
Imperial or English . . . .	277.274	10.00	6.232102	
United States . . . . .	231.	8.33111	7.480519	

A "miner's inch" of water is approximately equal to a supply of 12 U. S. gallons per minute.

## DIAMETERS AND AREAS OF CIRCLES OR CYLINDERS.

Diameter, Inches.	Area, Inches.	Diameter, Inches.	Area, Inches.	Diameter, Inches.	Area, Inches.	Diameter, Inches.	Area, Inches.
1	.7854	2 $\frac{1}{4}$	5.9395	5	19.635	12	113.098
$1\frac{1}{4}$	1.2271	3	7.0686	$5\frac{1}{2}$	23.758	15	176.715
$1\frac{1}{2}$	1.7671	$3\frac{1}{4}$	8.2957	6	28.274	18	254.470
$1\frac{3}{4}$	2.4043	$3\frac{1}{2}$	9.6211	7	38.484	20	314.160
2	3.1416	$3\frac{3}{4}$	11.044	8	50.265	24	452.391
$2\frac{1}{4}$	3.9760	4	12.566	9	63.617	..	....
$2\frac{1}{2}$	4.9087	$4\frac{1}{2}$	15.904	10	78.540	..	....

## APPROXIMATE QUANTITIES OF WATER DELIVERED PER HOUR BY SINGLE-ACTING PUMPS.

From 2-inch to 6-inch diameter x 4-inch, 6-inch, 8-inch and 12-inch length of stroke respectively, and worked at 30 strokes per minute.

Diameter Working Barrel or Cylinder, Inches.	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	3	3 $\frac{1}{4}$	4	4 $\frac{1}{2}$	5	6	7	8
Gallons delivered by Pumps with 4-inch stroke . . .	70	90	120	160	220	280	360	450	650	885	1155
" " " " 6 " " " " . . .	105	135	180	240	330	420	540	675	975	1326	1721
" " " " 8 " " " " . . .	140	180	240	320	440	560	720	900	1300	1770	2310
" " " " 10 " " " " . . .	175	225	300	400	550	700	900	1125	1625	2212	2887
" " " " 12 " " " " . . .	210	270	360	480	660	840	1080	1350	1950	2652	3442

If Pump be worked at 40 strokes per minute, the quantity delivered will be, of course, one-third more than named above; if at 20 strokes only, one-third less water will be delivered, and so on.

Double-Barrel Pumps, having two cylinders each of above diameters, or Double-Acting Pumps, will deliver twice the quantities named above.

# TABLE OF CAPACITY OF PUMPS.

The figures at the extreme right and left of the Table are piston, or plunger, diameters; the line of figures across the top are piston, or plunger, strokes; the figures in the body of the Table are the capacity, or displacement, in gallons, corresponding to a single stroke. To find the capacity, for one revolution, multiply the capacity for a single stroke by one, two, three, or four, for single, duplex, triplex, or quadruplex, single-acting; and by two, four, or six, double-acting Pumps.

Table Showing Capacity of Pumps of Given Diameter and Length Stroke.

Dia. of Cyl. Ins.	LENGTH OF STROKE IN INCHES, AND CAPACITY PER STROKE IN GALLONS OF PUMP CYLINDER WITH GIVEN DIAMETER.																Dia. of Cyl. Ins.
	2	3	4	5	6	7	8	9	10	12	14	15	16	18	20	24	
1¼	.0106	.0159	.0212	.0266	.0319	.0372	.0425	.0478	.0531	.0637	.0743	.0797	.0848	.0955	.1062	.1274	1¼
1½	.0128	.0192	.0256	.0321	.0385	.0449	.0513	.0578	.0642	.077	.089	.0963	.1027	.1156	.1280	.1541	1½
1¾	.0153	.0229	.0306	.0382	.0459	.0535	.0612	.0688	.0765	.0918	.1071	.1147	.1224	.1377	.1530	.1836	1¾
2	.0208	.0312	.0416	.0521	.0625	.0729	.0833	.0937	.1041	.1249	.1457	.1562	.1666	.1874	.2082	.2499	2
2¼	.0272	.0408	.0544	.068	.0816	.0952	.1088	.1224	.136	.1632	.1904	.204	.2176	.2448	.2720	.3264	2¼
2½	.0344	.0516	.0688	.086	.1033	.1205	.1377	.1548	.1721	.2063	.241	.258	.2754	.3096	.3442	.4128	2½
2¾	.0425	.0637	.085	.1062	.1275	.1487	.17	.1912	.2125	.255	.2975	.3187	.34	.3825	.425	.51	2¾
3	.0514	.0771	.1028	.1285	.1543	.1799	.2057	.2313	.2571	.3085	.3598	.3855	.4114	.4626	.5142	.617	3
3¼	.0612	.0918	.1224	.1530	.1836	.2142	.2448	.2754	.306	.3672	.4284	.459	.4896	.5508	.612	.7344	3¼
3½	.0718	.1077	.1436	.1795	.2154	.2513	.2872	.3231	.3594	.4312	.503	.5385	.5748	.6466	.7182	.8624	3½
3¾	.0833	.1249	.1666	.2082	.2499	.2915	.3332	.3748	.4165	.4998	.5831	.6247	.6664	.7497	.833	.9996	3¾
4	.0950	.1434	.1912	.239	.2868	.3346	.3824	.4302	.478	.5736	.6692	.687	.7648	.8605	.9561	1.147	4
4¼	.1088	.1632	.2176	.272	.3264	.3808	.4352	.4896	.544	.6528	.7616	.816	.8704	.9792	1.088	1.3056	4¼
4½	.1228	.1842	.2456	.307	.3684	.4298	.4912	.5526	.6141	.7368	.8596	.921	.9824	1.105	1.228	1.473	4½
4¾	.1377	.2065	.2754	.3442	.4131	.4819	.5508	.6196	.6885	.8262	.9639	1.0327	1.1016	1.2393	1.377	1.6524	4¾
5	.1534	.2301	.3068	.3835	.4602	.5369	.6136	.6903	.7671	.9204	1.073	1.15	1.227	1.393	1.534	1.84	5
5¼	.17	.2550	.34	.425	.51	.595	.68	.765	.85	1.02	1.19	1.275	1.36	1.53	1.7	2.04	5¼
5½	.1874	.2811	.3748	.4685	.5622	.6559	.7496	.8433	.9371	1.124	1.311	1.405	1.499	1.686	1.874	2.248	5½
5¾	.2057	.3085	.4114	.5142	.6171	.7199	.8228	.9256	1.0285	1.2342	1.4399	1.5427	1.6456	1.8513	2.057	2.4684	5¾
6	.2248	.3372	.4496	.562	.6744	.7868	.8992	1.011	1.124	1.348	1.573	1.686	1.789	2.022	2.248	2.696	6
6¼	.2448	.3672	.4896	.612	.7344	.8568	.9792	1.1016	1.2240	1.4688	1.7136	1.8362	1.9584	2.2032	2.448	2.9376	6¼
6½	.2656	.3984	.5312	.6640	.7968	.9296	1.0624	1.1952	1.328	1.593	1.859	1.992	2.124	2.39	2.656	3.186	6½
6¾	.2872	.4308	.5744	.7182	.8616	1.0052	1.1488	1.2926	1.4364	1.7955	2.0109	2.1546	2.2982	2.5885	2.8728	3.4473	6¾
7	.3098	.4647	.6196	.7745	.9294	1.084	1.239	1.394	1.549	1.858	2.168	2.323	2.479	2.788	3.098	3.716	7
7¼	.3332	.4998	.6664	.833	.9996	1.1662	1.3328	1.4994	1.666	1.9992	2.3324	2.499	2.6656	2.9988	3.332	3.9984	7¼
8	.4084	.6126	.8168	1.021	1.225	1.429	1.633	1.837	2.042	2.45	2.858	3.063	3.268	3.674	4.084	4.9	8
8¼	.4352	.6528	.8704	1.088	1.3056	1.5232	1.7408	1.9584	2.176	2.6112	3.0464	3.264	3.4816	3.9168	4.352	5.2224	8¼
9	.5508	.8262	1.1016	1.377	1.6524	1.9278	2.2032	2.4786	2.754	3.3048	3.8556	4.131	4.4064	5.0572	5.508	6.6096	9
10	.68	1.02	1.36	1.7	2.04	2.38	2.72	3.06	3.4	4.08	4.76	5.1	5.44	6.12	6.8	8.16	10
11	.8227	1.2341	1.6455	2.057	2.464	2.879	3.2911	3.7258	4.1139	4.9367	5.7595	6.1709	6.5823	7.4051	8.2279	9.8735	11
12	.9792	1.468	1.9584	2.448	2.9376	3.4222	3.9168	4.4064	4.896	5.8752	6.8544	7.344	7.833	8.8128	9.792	11.7504	12
13	1.149	1.723	2.297	2.872	3.445	4.022	4.596	5.170	5.745	6.894	8.042	8.616	9.192	10.34	11.49	13.78	13
14	1.332	1.998	2.665	3.331	3.997	4.664	5.33	5.996	6.663	7.994	9.328	9.993	10.66	11.99	13.32	15.98	14
15	1.529	2.294	3.059	3.824	4.589	5.354	6.119	6.884	7.649	9.178	10.70	11.47	12.23	13.76	15.29	18.35	15
16	1.74	2.61	3.48	4.35	5.22	6.09	6.96	7.83	8.703	10.44	12.18	13.05	13.92	15.66	17.40	20.88	16
18	2.202	3.303	4.404	5.505	6.606	7.707	8.808	9.909	11.01	13.21	15.41	16.51	17.61	19.81	22.02	26.42	18
20	2.720	4.08	5.440	6.8	8.16	9.52	10.88	12.24	13.6	16.32	19.04	20.4	21.76	24.48	27.2	32.64	20

## FRICTION OF WATER IN PIPES.

Friction loss in pounds pressure per square inch for each 100 feet of length in different size clean iron pipe, discharging given quantities of water per minute. G. A. ELLIS, C. E.

Gallons per Minute.	SIZES OF PIPE.—INSIDE DIAMETER.											
	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	4 in.	6 in.	8 in.	10 in.	12 in.
5	3.3	0.84	0.31	0.12	...	...	...	...	...	...	...	...
10	13.0	3.16	1.05	0.47	0.12	...	...	...	...	...	...	...
15	28.7	6.98	2.38	0.97	...	...	...	...	...	...	...	...
20	50.4	12.3	4.07	1.66	0.42	...	...	...	...	...	...	...
25	78.0	19.0	6.40	2.62	...	0.21	0.10	...	...	...	...	...
30	...	27.5	9.15	3.75	0.91	...	...	...	...	...	...	...
35	...	37.0	12.4	5.05	...	...	...	...	...	...	...	...
40	...	48.0	16.1	6.52	1.60	...	...	...	...	...	...	...
45	...	...	20.2	8.15	...	...	...	...	...	...	...	...
50	...	...	24.9	10.0	2.44	0.81	0.35	0.09	...	...	...	...
75	...	...	56.1	22.4	5.32	1.80	0.74	...	...	...	...	...
100	...	...	...	39.0	9.46	3.20	1.31	0.33	0.05	...	...	...
125	...	...	...	...	14.9	4.89	1.99	...	...	...	...	...
150	...	...	...	...	21.2	7.0	2.85	0.69	0.10	...	...	...
175	...	...	...	...	28.1	9.46	3.85	...	...	...	...	...
200	...	...	...	...	37.5	12.47	5.02	1.22	0.17	...	...	...
250	...	...	...	...	...	19.66	7.76	1.89	0.26	0.07	0.03	0.01
300	...	...	...	...	...	28.06	11.2	2.66	0.37	0.09	0.04	...
350	...	...	...	...	...	...	15.2	3.65	0.50	0.12	0.05	0.02
400	...	...	...	...	...	...	19.5	4.73	0.65	0.16	0.06	...
500	...	...	...	...	...	...	30.8	7.43	0.96	0.25	0.09	0.04
750	...	...	...	...	...	...	...	...	2.21	0.53	0.18	0.08
1000	...	...	...	...	...	...	...	...	3.88	0.94	0.32	0.13
1250	...	...	...	...	...	...	...	...	...	1.46	0.49	0.20
1500	...	...	...	...	...	...	...	...	...	...	0.70	0.29
1750	...	...	...	...	...	...	...	...	...	...	0.95	0.38
2000	...	...	...	...	...	...	...	...	...	...	1.23	0.49

## TABLE FOR EQUALIZING PIPES.

The size of main pipe is given in the column at the left. The number of branches is given in the line on top, and the proper size of branches is given in the body of the table on the line of each main and beneath the desired number of branches.

In commercial sizes the nominal 1¼-inch pipe is generally over-size. Often as large as 1½. It is safe to call it 1.3 inches, and it is so figured in the table. Exact sizes are given for branch pipes. The designer of the pipe system can thus better select the commercial sizes to be used.

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Size of Main Pipe.	NUMBER OF BRANCHES.															
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1 in.	.758	.644	.574	.525	.488	.459	.435	.415	.398	.383	.370	.358	.348	.338	.330	
1¼ "	.985	.838	.747	.682	.635	.597	.555	.540	.518	.498	.482	.466	.452	.440	.428	
1½ "	1.14	.967	.861	.788	.733	.689	.653	.623	.597	.575	.555	.538	.522	.508	.494	
2 "	1.52	1.29	1.15	1.05	.977	.918	.870	.830	.796	.766	.740	.717	.696	.677	.660	
2½ "	1.89	1.61	1.44	1.31	1.22	1.15	1.09	1.09	.995	.958	.925	.896	.870	.846	.825	
3 "	2.27	1.92	1.72	1.58	1.47	1.38	1.31	1.25	1.19	1.15	1.11	1.08	1.04	1.02	.989	
3½ "	2.65	2.26	2.01	1.84	1.71	1.61	1.52	1.45	1.39	1.34	1.30	1.25	1.22	1.18	1.15	
4 "	3.03	2.58	2.30	2.10	1.95	1.84	1.74	1.66	1.59	1.53	1.48	1.43	1.39	1.35	1.32	
4½ "	3.41	2.90	2.58	2.36	2.20	2.07	1.96	1.87	1.79	1.72	1.67	1.61	1.57	1.52	1.48	
5 "	3.79	3.22	2.87	2.63	2.44	2.30	2.18	2.08	1.99	1.92	1.85	1.79	1.74	1.69	1.65	
6 "	4.55	3.87	3.45	3.15	2.93	2.75	2.61	2.49	2.39	2.30	2.22	2.15	2.09	2.03	1.98	
7 "	5.30	4.51	4.02	3.68	3.42	3.21	3.05	2.91	2.79	2.68	2.59	2.51	2.44	2.37	2.31	
8 "	6.06	5.16	4.59	4.20	3.91	3.67	3.48	3.32	3.18	3.09	2.96	2.87	2.78	2.71	2.64	
9 "	6.82	5.80	5.17	4.73	4.40	4.13	3.92	3.74	3.58	3.45	3.33	3.23	3.13	3.04	2.97	
10 "	7.58	6.44	5.74	5.25	4.88	4.59	4.35	4.15	3.98	3.83	3.70	3.59	3.48	3.38	3.30	
12 "	9.08	7.73	6.89	6.30	5.86	5.51	5.22	4.98	4.78	4.60	4.44	4.30	4.18	4.06	3.96	



**TABLE OF THEORETICAL HORSE POWER REQUIRED TO RAISE WATER TO DIFFERENT HEIGHTS.**

Feet.	5	10	15	20	25	30	35	40	45	50	60	75	90	100	125	150	175	200	250	300	350	400	Feet.
Gals. per Minute.																							Gals. per Minute.
5	.006	.012	.019	.025	.031	.037	.044	.05	.06	.07	.07	.09	.11	.12	.16	.19	.22	.25	.31	.37	.44	.50	5
10	.012	.025	.037	.050	.062	.075	.087	.10	.11	.12	.15	.19	.22	.25	.31	.37	.44	.50	.62	.75	.87	1.00	10
15	.019	.037	.056	.075	.094	.112	.131	.15	.17	.19	.22	.28	.34	.37	.47	.56	.66	.75	.94	1.12	1.31	1.50	15
20	.025	.050	.075	.100	.125	.150	.175	.20	.22	.25	.30	.37	.45	.50	.62	.75	.87	1.00	1.25	1.50	1.75	2.00	20
25	.031	.062	.093	.125	.156	.187	.219	.25	.28	.31	.37	.47	.56	.62	.78	.94	1.09	1.25	1.56	1.87	2.19	2.50	25
30	.037	.075	.112	.150	.187	.225	.262	.30	.34	.37	.45	.56	.67	.75	.94	1.12	1.31	1.50	1.87	2.25	2.62	3.00	30
35	.043	.087	.131	.175	.219	.262	.306	.35	.39	.44	.52	.66	.79	.87	1.08	1.31	1.53	1.75	2.16	2.62	3.06	3.50	35
40	.050	.100	.150	.200	.250	.300	.350	.40	.45	.50	.60	.75	.90	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	40
45	.056	.112	.168	.225	.281	.337	.394	.45	.51	.56	.67	.84	1.01	1.12	1.41	1.66	1.97	2.25	2.81	3.37	3.94	4.50	45
50	.062	.125	.187	.250	.312	.375	.437	.50	.56	.62	.75	.94	1.12	1.25	1.56	1.87	2.19	2.50	3.12	3.75	4.37	5.00	50
60	.075	.150	.225	.300	.375	.450	.525	.60	.67	.75	.90	1.12	1.35	1.50	1.87	2.25	2.62	3.00	3.75	4.50	5.25	6.00	60
75	.093	.187	.281	.375	.469	.562	.656	.75	.84	.94	1.12	1.40	1.69	1.87	2.34	2.81	3.28	3.75	4.69	5.62	6.56	7.50	75
90	.112	.225	.337	.450	.562	.675	.787	.90	1.01	1.12	1.35	1.68	2.02	2.25	2.81	3.37	3.94	4.50	5.62	6.75	7.87	9.00	90
100	.125	.250	.375	.500	.625	.750	.875	1.00	1.12	1.25	1.50	1.87	2.25	2.50	3.12	3.75	4.37	5.00	6.25	7.50	8.75	10.00	100
125	.156	.312	.469	.625	.781	.937	1.094	1.25	1.41	1.56	1.87	2.34	2.81	3.12	3.91	4.69	5.47	6.25	7.81	9.37	10.94	12.50	125
150	.187	.375	.562	.750	.937	1.125	1.312	1.50	1.69	1.87	2.25	2.81	3.37	3.75	4.69	5.62	6.56	7.50	9.37	11.25	13.12	15.00	150
175	.219	.437	.656	.875	1.093	1.312	1.531	1.75	1.97	2.19	2.62	3.28	3.94	4.37	5.47	6.56	7.66	8.75	10.94	13.12	15.31	17.50	175
200	.250	.500	.750	1.000	1.250	1.500	1.750	2.00	2.25	2.50	3.00	3.75	4.50	5.00	6.25	7.50	8.75	10.00	12.50	15.00	17.50	20.00	200
250	.312	.625	.937	1.250	1.562	1.875	2.187	2.50	2.81	3.12	3.75	4.69	5.62	6.25	7.81	9.37	10.94	12.50	15.72	18.75	21.87	25.00	250
300	.375	.750	1.125	1.500	1.875	2.250	2.625	3.00	3.37	3.75	4.50	5.62	6.75	7.50	9.37	11.25	13.12	15.00	18.75	22.50	26.25	30.00	300
350	.437	.875	1.312	1.750	2.187	2.625	3.062	3.50	3.94	4.37	5.25	6.56	7.87	8.75	10.94	13.12	15.31	17.50	21.87	26.25	30.62	35.00	350
400	.500	1.000	1.500	2.000	2.500	3.000	3.500	4.00	4.50	5.00	6.00	7.50	9.00	10.00	12.50	15.00	17.50	20.00	25.00	30.00	35.00	40.00	400
500	.625	1.250	1.875	2.500	3.125	3.750	4.375	5.000	5.62	6.25	7.50	9.37	11.25	12.50	15.62	18.75	21.87	25.00	31.25	37.50	43.75	50.00	500

**TABLE FOR CONVERTING FEET HEAD OF WATER INTO PRESSURE PER SQUARE INCH.**

Feet. Head.	Pounds per Square Inch.	Feet. Head.	Pounds per Square Inch.	Feet. Head.	Pounds per Square Inch.
1	.43	55	23.82	190	82.29
2	.87	60	25.99	200	86.62
3	1.30	65	28.15	225	97.45
4	1.73	70	30.32	250	108.27
5	2.17	75	32.48	275	119.10
6	2.60	80	34.65	300	129.93
7	3.03	85	36.81	325	140.75
8	3.46	90	38.98	350	151.58
9	3.90	95	41.14	375	162.41
10	4.33	100	43.31	400	173.24
15	6.50	110	47.64	500	216.55
20	8.66	120	51.97	600	259.85
25	10.83	130	56.30	700	303.16
30	12.99	140	60.63	800	346.47
35	15.16	150	64.96	900	389.78
40	17.32	160	69.29	1000	433.09
45	19.49	170	73.63	...	...
50	21.65	180	77.96	...	...

**TABLE FOR CONVERTING PRESSURE PER SQUARE INCH INTO FEET HEAD OF WATER.**

Pounds per Square Inch.	Feet. Head.	Pounds per Square Inch.	Feet. Head.	Pounds per Square Inch.	Feet. Head.
1	2.31	55	126.99	180	415.61
2	4.62	60	138.54	190	438.90
3	6.93	65	150.08	200	461.78
4	9.24	70	161.63	225	519.51
5	11.54	75	173.17	250	577.24
6	13.85	80	184.72	275	643.03
7	16.16	85	196.26	300	692.69
8	18.47	90	207.81	325	750.41
9	20.78	95	219.35	350	808.13
10	23.09	100	230.89	375	865.89
15	34.63	110	253.98	400	922.58
20	46.18	120	277.07	500	1154.48
25	57.72	125	288.62	...	...
30	69.27	130	300.16	...	...
35	80.81	140	323.25	...	...
40	92.36	150	346.34	...	...
45	103.90	160	369.43	...	...
50	115.45	170	392.52	...	...

**PERCENTAGE OF SAVING OF FUEL BY HEATING FEED-WATER. (Steam at 60 lbs.)**

Final Temperature.	INITIAL TEMPERATURE.											
	32°	40°	50°	60°	70°	80°	90°	100°	120°	140°	160°	180°
60°	2.39	1.71	.86									
80°	4.09	3.43	2.59	1.74	0.88							
100°	5.79	5.14	4.32	3.49	2.64	1.77	.90					
120°	7.50	6.85	6.05	5.23	4.40	3.55	2.68	1.80				
140°	9.20	8.57	7.77	6.97	6.15	5.32	4.47	3.61	1.84			
160°	10.90	10.28	9.50	8.72	7.91	7.09	6.26	5.42	3.67	1.87		
180°	12.60	12.00	11.23	10.46	9.68	8.87	8.06	7.23	5.52	3.75	1.91	
200°	14.30	13.71	13.00	12.20	11.43	10.65	9.85	9.03	7.30	5.62	3.82	1.96
220°	16.00	15.42	14.70	14.00	13.19	12.33	11.64	10.84	9.20	7.50	5.73	3.93
240°	17.79	17.30	16.42	15.69	14.96	14.20	13.43	12.65	11.05	9.37	7.64	5.90
260°	19.40	18.85	18.15	17.44	16.71	15.97	15.22	14.45	11.88	11.24	9.56	7.86

**PERCENTAGE OF SAVING OF FUEL BY DIRECT ACTING STEAM AND GEARED PUMPS.**

Manner of Feeding Boiler.	Temperature of Fahr.	Relative Amt's of Coal Required Equal Times.	Fuel Saved Over First Case, per. Cwt.
1. Direct Acting Steam Pump, no heater . . . . .	60°	100	0.
2. Injector, no heater . . . . .	150°	98.5	1.5
3. Injector, with heater . . . . .	200°	93.8	6.2
4. Direct Acting Steam Pump, with heater . . . . .	200°	87.9	12.1
5. Geared Pump, actuated by the main engine, with heater,	200°	86.8	13.8

**WROUGHT-IRON WELDED PIPE.**

Dimensions, Weights, etc., of standard sizes for Steam, Gas, Water, Oil, etc.

1 inch and below are butt-welded, and proved to 300 pounds per square inch hydraulic pressure.

1½ inch and above are lap-welded, and proved to 500 pounds per square inch hydraulic pressure.

**CAPACITY OF ROUND TANKS AND CISTERNS IN  
U. S. GALLONS, PER FOOT IN HEIGHT.**

Diameter Feet.	Gallons.	Diameter Feet.	Gallons.
2	23.5	17	1,698
3	52.9	18	1,903
4	94	19	2,121
5	147	20	2,350
6	212	22	2,844
7	288	24	3,384
8	376	26	3,971
9	476	28	4,606
10	588	30	5,288
11	711	32	6,016
12	846	36	7,617
13	993	40	9,400
14	1,152	45	11,897
15	1,322	50	14,688
16	1,504	60	21,151

Nominal Inside Diameter.	Actual Outside Diameter.	Internal Area.	Weight per Foot of Length.	Contents in Gallons per Foot.	Weight of Water per Foot of Length.
Inches.	Inches.	Inches.	Lbs.		Lbs.
1/2	.84	.304	.84	.0102	.085
3/4	1.05	.533	1.12	.0230	.190
1	1.31	.862	1.67	.0408	.349
1 1/4	1.66	1.496	2.25	.0638	.527
1 1/2	1.9	2.038	2.69	.0918	.760
2	2.37	3.355	3.66	.1632	1.356
2 1/2	2.87	4.783	5.77	.2550	2.116
3	3.5	7.388	7.54	.3673	3.049
3 1/2	4	9.837	9.05	.4998	4.155
4	4.5	12.730	10.72	.6528	5.405
4 1/2	5	15.939	12.49	.8263	6.851
5	5.56	19.990	14.56	1.020	8.500
6	6.62	28.889	18.76	1.469	12.312

## RULES TO DETERMINE THE SIZE AND SPEED OF PULLEYS OR GEARS.

The driving pulley is called the Driver, and the driven pulley the Driven.

If the number of *teeth in gears* are used instead of diameter, in these calculations, number of teeth must be substituted wherever diameter occurs.

To find the diameter of Driver, the diameter of the Driven and its revolutions, and also revolutions of Driver being given: Multiply the diameter of Driven by its revolutions, and divide the product by the revolutions of the Driver; the quotient will give the diameter of the Driver.

To find the diameter of Driven, the revolutions of the Driven, also diameter and revolutions of the Driver being given: Multiply the diameter of Driver by its revolutions, and divide the product by the revolutions of the Driven; the quotient will give the diameter of the Driven.

To find the revolutions of the Driver, the diameter and revolutions of the Driven, also diameter of the Driver being given: Multiply the diameter of Driven by its revolutions, and divide the product by the diameter of Driver; the quotient will give the revolutions of Driver.

To find the revolutions of the Driven, the diameter and revolutions of the Driver, also diameter of the Driven being given: Multiply the diameter of Driver by its revolutions, and divide the product by the diameter of Driven; the quotient will give the revolutions of Driven.

### HORSE POWER BELTING WILL TRANSMIT

Width of Belt in inches.	HORSE POWER PER 100 FT. VELOCITY OF BELT.		Width of Belt in inches.	HORSE POWER PER 100 FT. VELOCITY OF BELT.	
	Single Belt.	Double Belt.		Single Belt.	Double Belt.
1	.09	.18	12	1.09	2.18
2	.18	.36	14	1.27	2.55
3	.27	.55	16	1.45	2.91
4	.36	.73	18	1.64	3.27
5	.45	.91	20	1.82	3.64
6	.55	1.09	22	2.00	4.00
7	.64	1.27	24	2.18	4.36
8	.73	1.46	28	2.55	5.09
9	.82	1.64	32	2.91	5.82
10	.91	1.82	36	3.27	6.55
11	1.	2.	40	3.64	7.27

In the calculations for horse powers in the above table, the belt is assumed to run about horizontally, the semi-circumference of smaller pulley has been considered as the ordinary arc contact of belt. Any reduction of this contact will make approximate proportional reduction of horse power.

### HORSE POWER SHAFTING WILL TRANSMIT

Diameter of Shaft in inches.	REVOLUTIONS PER MINUTE.									
	100	125	150	175	200	225	250	300	350	400
15-16	1.2 h. p.	1.4 h. p.	1.7 h. p.	2.1 h. p.	2.4 h. p.	2.6 h. p.	3.1 h. p.	3.6 h. p.	4.3 h. p.	5.0 h. p.
1 3-16	2.4 "	3.1 "	3.7 "	4.3 "	4.9 "	5.5 "	6.1 "	7.3 "	8.5 "	9.7 "
1 7-16	4.3 "	5.3 "	6.4 "	7.4 "	8.5 "	9.5 "	10.5 "	12.7 "	14.8 "	16.9 "
1 11-16	6.7 "	8.4 "	10.1 "	11.7 "	13.4 "	15.1 "	16.7 "	20.1 "	23.4 "	26.8 "
2 15-16	10.0 "	12.5 "	15.0 "	17.5 "	20.0 "	22.5 "	25.0 "	30.0 "	35.0 "	40.0 "
2 3-16	14.3 "	17.8 "	21.4 "	24.9 "	28.5 "	32.1 "	35.6 "	42.7 "	49.8 "	57.0 "
2 7-16	19.5 "	24.4 "	29.3 "	34.1 "	39.0 "	44.1 "	48.7 "	58.5 "	68.2 "	78.0 "
2 11-16	26.0 "	32.5 "	39.0 "	43.5 "	52.0 "	58.5 "	65.0 "	78.0 "	87.0 "	104.0 "
2 15-16	33.8 "	42.2 "	50.6 "	59.1 "	67.5 "	75.9 "	84.4 "	101.3 "	118.2 "	135.0 "
3 3-16	43.0 "	53.6 "	64.4 "	75.1 "	85.8 "	96.6 "	107.3 "	128.7 "	150.3 "	171.6 "
3 7-16	53.6 "	67.0 "	79.4 "	93.8 "	107.2 "	120.1 "	134.0 "	158.8 "	187.6 "	214.4 "
3 11-16	65.9 "	82.4 "	97.9 "	115.4 "	131.8 "	148.3 "	164.8 "	195.7 "	230.7 "	243.6 "
3 15-16	80.0 "	100.0 "	120.0 "	140.0 "	160.0 "	180.0 "	200.0 "	240.0 "	280.0 "	320.0 "
4 7-16	113.9 "	142.4 "	170.8 "	199.3 "	227.8 "	256.2 "	284.7 "	341.7 "	398.6 "	455.6 "
4 15-16	156.3 "	195.3 "	234.4 "	273.4 "	312.5 "	351.5 "	390.6 "	468.7 "	546.8 "	625.0 "

# WEIGHTS AND MEASURES.

METRIC SYSTEM.		U. S. STANDARD.		METRIC SYSTEM.		U. S. STANDARD.	
<b>Length.</b>		<b>Length.</b>		<b>Weight.</b>		<b>Weight.</b>	
1 millimeter	= .0394 inches.	1 inch	= 2.5399 centimeters.	1 gram	= 15.4323 grains.	1 lb.	= 4536 kilos.
1 centimeter	= .3937 inches.	1 foot	= 30.4794 centimeters.	1 KILOGRAM	= 2.2046 lbs.	1 cwt.	= 50.8024 kilos.
1 METER	= 39.3708 inches.	1 yard	= .9143 meters.	1 tonneau	= 2204.55 lbs.	1 ton	= 1016.0488 kilos.
1 kilometer	= 0.6214 miles.	1 mile	= 1.6093 kilometers.	<b>Dry Measure.</b>		<b>Dry Measure.</b>	
<b>Square.</b>		<b>Square.</b>		1 centiliter	= .0181 pints.	1 pint	= 55.0661 centiliters.
1 sq. centimeter	= .1549 sq. in.	1 sq. in.	= 6.4513 sq. centimeters.	1 LITER	= .908 quarts.	1 quart	= 1.1013 liters.
1 sq. meter	= 10.7631 sq. feet.	1 sq. ft.	= .0929 sq. meters.	1 hectoliter	= 2.837 bushels.	1 bushel	= 35.2416 liters.
1 ARE	= 119.5894 sq. yds.	1 sq. yd.	= .8361 sq. meters.	<b>Liquid Measure.</b>		<b>Liquid Measure.</b>	
1 hectare	= 2.4711 acres.	1 acre	= .4047 hectares.	1 centiliter	= .0211 pints.	1 pint	= 47.3171 centiliters.
<b>Cubic.</b>		<b>Cubic.</b>		1 LITER	= 1.0567 quarts.	1 quart	= .9563 liters.
1 CUBIC METER	= 35.3168 cubic ft.	1 cubic foot	= .02831 cubic meters.	1 hectoliter	= 26.4176 gallons.	1 gallon	= 3.7854 liters.

1 U. S. ton of shipping = 40 cubic feet = 32.143 U. S. bushels = 1.1326 cubic meters.

*Minimum freight charged on a SS. B | L is on 20 cubic feet.*

# ESTIMATE OF VALUES OF FOREIGN COINS.

COUNTRY.	MONETARY UNIT.	VALUE IN TERMS OF U. S. GOLD DOLLAR.	COUNTRY.	MONETARY UNIT.	VALUE IN TERMS OF U. S. GOLD DOLLAR.
Argentine Republic . . . . .	Peso . . . . .	\$0.96,5	German Empire . . . . .	Mark . . . . .	\$0.23,8
Austria-Hungary . . . . .	Crown . . . . .	.20,3	Great Britain . . . . .	Pound sterling . . . . .	4.86,6½
Belgium . . . . .	Frank . . . . .	.19,3	Greece . . . . .	Drachma . . . . .	.19,3
Bolivia . . . . .	Boliviano . . . . .	.45,7	Haiti . . . . .	Gourde . . . . .	.96,5
Brazil . . . . .	Milreis . . . . .	.54,6	India . . . . .	Rupee . . . . .	.21,7
British Possessions, N. A. . . . .	Dollar . . . . .	1.00	Italy . . . . .	Lira . . . . .	.19,3
(Except Newfoundland)			Japan . . . . .	Yen { Gold . . . . .	.99,7
Central American States:				Yen { Silver . . . . .	.49,3
Costa Rica . . . . .	Peso . . . . .	.45,7	Liberia . . . . .	Dollar . . . . .	1.00
Guatemala . . . . .			Mexico . . . . .	Dollar . . . . .	.49,7
Honduras . . . . .			Netherlands . . . . .	Florin . . . . .	.40,2
Nicaragua . . . . .			Newfoundland . . . . .	Dollar . . . . .	1.01,4
Salvador . . . . .			Norway . . . . .	Crown . . . . .	.26,8
Chili . . . . .	Peso . . . . .	.91,2	Peru . . . . .	Sol . . . . .	.45,7
China . . . . .	Tael { Shanghai . . . . .	.67,7	Portugal . . . . .	Milreis . . . . .	1.08
	{ Haikwan . . . . .	.75,3	Russia . . . . .	Ruble { Gold . . . . .	.77,2
	{ (Customs) . . . . .			Ruble { Silver . . . . .	.36,6
Colombia . . . . .	Peso . . . . .	.45,7	Spain . . . . .	Peseta . . . . .	.19,3
Cuba . . . . .	Peso . . . . .	.92,6	Sweden . . . . .	Crown . . . . .	.26,8
Denmark . . . . .	Crown . . . . .	.26,8	Switzerland . . . . .	Franc . . . . .	.19,3
Ecuador . . . . .	Sucre . . . . .	.45,7	Tripoli . . . . .	Mahbub, 20 piastres, . . . . .	.41,3
Egypt . . . . .	Pound (100 piastres) . . . . .	4.94,3	Turkey . . . . .	Plastre . . . . .	.04,4
Finland . . . . .	Mark . . . . .	.19,3	Venezuela . . . . .	Bollvar . . . . .	.19,3
France . . . . .	Franc . . . . .	.19,3			

# PUMP REPAIRS.

*In the following tables will be found a condensed Price List of parts of our leading Pumps. Want of space has necessitated our omitting list of Repairs for special classes of Pumps, etc., but shall be pleased to quote upon application.*

<b>Levers or Handles.</b>		<b>"Empire" Double Acting Well Force Pumps, Figs.</b>	
Cistern Pumps, Figs. 198, 199, 200, 201, 202½, 210,		1025 and 1027 .....	\$0.90
1051 — Nos. 0, 1, 2.....	\$0.50	Figs. 1026 and 1028.....	1.15
No. 3.....	.60	Well Force Pump, Fig. 1021.....	.75
No. 4.....	.70	Fig. 855.....	1.40
No. 5.....	1.00	Fig. 857.....	1.25
No. 6.....	1.25	Deep Well Pumps, Figs. 236, 237, 887 .....	1.75
No. 8.....	1.50	Figs. 592 and 593.....	2.75
Pitcher Pumps, Figs. 923, 205, 205½, 208, 209 — Nos. 1,		Wind Mill Pumps, Fig. 762—No. 3 .....	1.25
2, 3, 4.....	.60	Nos. 4 and 5.....	1.40
No. 5.....	.75	Figs. 1032 and 1039, 6-inch stroke.....	1.00
"Star" Well Pumps, Figs. 206, 207, 845 — Nos. 1 and 2,	.75	10-inch stroke.....	1.25
Nos. 3, 4 and 5.....	.85	Fig. 412.....	1.40
Yard Well Pumps, Fig. 1020.....	.75	Figs. 1055 and 1056, 6-inch stroke.....	1.50
Figs. 486, 227 .....	1.50	10-inch stroke.....	1.75
Figs. 1018, 1023 .....	1.00	Fig. 780.....	1.75
Figs. 1019, 1024 .....	1.25	Figs. 764 and 765.....	2.00
"New Star" Well Pumps, Figs. 550, 847½.....	1.00	Wind Mill Force Pumps, Figs. 422, 423, 401, 402 and	
Figs. 551, 553, 848.....	1.25	413 .....	1.40
Figs. 846, 849, 850 — No. 3.....	1.00	Wind Mill Working Heads, Figs. 685 and 690.....	1.40
Nos. 4 and 5 .....	1.25	Anti-Freezing Wind Mill Force Pump, Figs. 1031, 1033,	
"New Star" Well Force Pumps, Figs. 852½, 853, 882½,		1045, 1048, 6-inch stroke.....	1.40
883, 1052.....	1.25	10-inch stroke.....	1.40
Figs. 424, 426, 1053.....	1.40	Adj. stroke.....	1.75
Well Force Pumps, Fig. 854..	1.40	"Pacific" Force Pumps, Figs. 674 and 601 — Nos. 2	
Fig. 240 .....	1.50	and 4.....	1.50
		Nos. 6 and 8.....	2.00

"Pacific" Force Pumps, Double-Acting, Figs. 840 and 841—Nos. 2 and 4.....	\$1.50
Nos. 6 and 8.....	2.00
House Force Pumps, Figs. 390 to 399 and 264—Nos. 0, 2 and 4.....	1.00
Nos. 6 and 8.....	1.50
House Force Pumps, Figs. 440, 441, 442, 480, 481, 281, 2.00	
House Force Pumps, Double-Acting, Figs. 273, 876 and 271—Nos. 0, 1, 2, 3 and 4.....	2.00
Nos. 6, 8 and 10.....	3.00

### Fulcrums or Bearer Tops.

Cistern Pumps, Figs. 198, 199, 200, 201, 202½, 210, and 1051—Nos. 0, 1 and 2.....	\$0.70
No. 3.....	.75
No. 4.....	.80
No. 5.....	.90
No. 6.....	1.10
No. 8.....	1.50
Pitcher Pumps, Figs. 208, 209, 205, Open Top—Nos. 1 and 2.....	.40
Nos. 3 and 4.....	.50
No. 5.....	.60
Figs. 923, 205½, 208, 209, closed top—No. 1.....	.60
No. 2.....	.70
No. 3.....	.85
No. 4.....	.95
"Star" Well Pumps, Figs. 206, 207 and 845—Nos. 1 and 2.....	.75
Nos. 3 and 4.....	.80
No. 5.....	.85
Yard Well Pumps, Fig. 1020.....	1.00

Fig. 227.....	\$1.50
Figs. 1018 and 1023.....	.75
Figs. 1019 and 1024.....	1.25
"New Star" Well Pumps, Fig. 550.....	.90
Fig. 551.....	1.10
Fig. 553.....	1.25
Figs. 846, 847½, 849—No. 3.....	.90
Nos. 4 and 5.....	1.10
Fig. 850—No. 3.....	1.15
Nos. 4 and 5.....	1.35
"New Star" Well Force Pumps, Figs. 852½, 853, 882½, 883, 1052.....	1.25
Figs. 424, 426 and 1053.....	1.50
Well Force Pumps, Fig. 854.....	1.25
Fig. 240.....	1.50
Fig. 1021.....	1.00
Well Force Pumps, Figs. 855, 857.....	1.25
Deep Well Pumps, Figs. 592, 593 and 763.....	3.00
Wind Mill Pumps, Fig. 762—No. 3, 6-inch stroke....	1.25
Nos. 4 and 5, 6-inch stroke.....	1.35
Nos. 4 and 5, 10-inch stroke.....	1.50
Figs. 1032 and 1039, 6-inch stroke.....	1.25
10-inch stroke.....	1.50
Fig. 412, 6-inch stroke.....	1.35
10-inch stroke.....	1.50
Figs. 1055 and 1056, 6-inch stroke.....	1.50
10-inch stroke.....	2.00
Fig. 780.....	2.50
Figs. 764 and 765, 6-inch stroke.....	3.50
10-inch stroke.....	4.25
Wind Mill Force Pumps, Figs. 422, 423, 401, 402, 413, 6-inch stroke.....	1.50

10-inch stroke.....	\$1.75
Wind Mill Working Heads, Figs. 685, 690, 6-inch stroke .....	1.50
10-inch stroke.....	1.75
Anti-Freezing Wind Mill Force Pumps, Figs. 1031, 1033, 1045 and 1048, 6-inch stroke.....	1.25
10-inch stroke.....	1.50
Adj. stroke.....	2.00
"Pacific" Force Pumps, Figs. 674 and 601 — Nos. 2 and 4.....	2.00
Nos. 6 and 8.....	3.50
"Pacific" Force Pumps, Double-Acting, Figs. 840 and 841 — Nos. 2 and 4.....	2.00
Nos. 6 and 8.....	3.50
House Force Pumps, Figs. 390 to 399 and 264 — Nos. 0 and 2.....	1.25
No. 4.....	1.50
Nos. 6 and 8.....	1.75
House Force Pumps, Figs. 440, 441, 442, 480, 481 and 281, .....	2.00
House Force Pumps, Double-Acting, Figs. 271, 273 and 876 — Nos. 0, 1, 2, 3 and 4.....	2.00
Nos. 6, 8 and 10.....	2.50

### Cylinders Only.

Cistern Pumps, Figs. 198, 199, 200, 201, 202½, 210 and 1051 — No. 0, 2 inch.....	\$1.45
No. 1, 2½ inch.....	1.60
No. 2, 2½ inch.....	1.80
No. 3, 2¾ inch.....	1.90
No. 4, 3 inch.....	2.25
No. 5, 3¼ inch.....	2.40
No. 6, 3½ inch.....	3.00

No. 8, 4 inch .....	\$4.00
Pitcher Pumps, Figs. 923, 205, 205½, 208 and 209 —	
No. 1, 2½ inch.....	1.50
No. 2, 3 inch.....	1.75
No. 3, 3½ inch.....	2.00
No. 4, 4 inch.....	2.25
No. 5, 4½ inch.....	2.50
"Pacific" Force Pumps, Figs. 674 and 601 — Nos. 2 and 4, 2½ and 3 inch.....	5.00
No. 6, 3½ inch.....	7.00
No. 8, 4 inch.....	8.00
"Pacific" Force Pumps, Double-Acting, Figs. 840, 841 and 878 — No. 2, 2½ inch.....	8.00
No. 4, 3 inch.....	10.00
No. 6, 3½ inch.....	13.00
No. 8, 4 inch.....	15.00
Hand Force Pumps, Figs. 390 to 399 and 264 — No. 0, 2 inch.....	3.00
Nos. 2 and 4, 2½ and 3 inch.....	4.00
No. 6, 3½ inch.....	6.00
No. 8, 4 inch.....	6.50
House Force Pumps, Figs. 440, 441, 442, 480, 481, 281, 714, 712, 713, 449 — No. 0, 2 inch .....	3.50
No. 2, 2½ inch.....	4.00
No. 3, 2¾ inch.....	4.25
No. 4, 3 inch.....	4.50
No. 5, 3¼ inch.....	5.00
No. 6, 3½ inch.....	6.00
House Force Pumps, Double-Acting, Figs. 271, 273, 450 and 452 — Nos. 0 and 1, 2 and 2½ inch.....	4.00
No. 2, 2½ inch.....	5.50
No. 3, 2¾ inch.....	6.00

No. 4, 3 inch.....	\$6.50
No. 6, 3½ inch.....	8.00
No. 8, 4 inch.....	11.00
No. 10, 4½ inch.....	14.00
Figs. 876, 879, 875 and 877 — No. 2, 2½ inch.....	8.00
No. 4, 3 inch.....	10.00
No. 6, 3½ inch.....	13.00
No. 8, 4 inch.....	15.00

### Standards Complete.

“Star” Well Pumps, Figs. 206 and 207 — No. 1 ....	\$3.75
No. 2 .....	4.25
No. 3 .....	4.50
No. 4 .....	5.00
No. 5 .....	5.25
Yard Well Pump, Fig. 227 — No. 5.....	8.00
No. 7 .....	8.50
Well Force Pumps, Fig. 240.....	13.00

### Stocks Only.

“Star” Well Pumps, Figs. 206, 207, and 845 — No. 1, \$2.00	
No. 2.....	2.25
No. 3.....	2.60
No. 4.....	2.75
No. 5.....	3.00
Yard Well Pumps, Fig. 227, No. 5 .....	4.00
No. 7.....	4.50
New Well Pumps, Figs. 1018, 1019, 1023 and 1024....	3.50
“New Star” Well Pumps, Figs. 550, 553.....	3.75
Fig. 551 .....	4.25

Fig. 847½ .....	\$3.50
Figs. 846, 849 and 850, No. 3.....	3.75
No. 4.....	4.25
No. 5.....	4.75
“New Star” Well Force Pumps, Figs. 852½, 882½, 424, 426, 1052 and 1053 .....	4.75
Figs. 853 and 883, No. 1 .....	4.75
No. 2.....	5.25
Well Force Pumps, Figs. 854 and 855.....	3.60
Fig. 240 .....	5.00
Well Pumps, Fig. 486 .....	5.00
Fig. 857.....	6.50
Deep Well Pumps, Figs. 236, 237 and 887, Top Section .....	3.00
Bottom Section .....	4.00
Figs. 592, 593 and 763, Top Section .....	4.00
Bottom Section .....	6.50
Wind Mill Pumps, Figs. 762 and 780, No. 3.....	3.75
No. 4.....	4.25
No. 5.....	4.75
Figs. 1032 and 1039.....	3.50
Fig. 412, Top Section.....	2.40
Bottom Section .....	3.60
Figs. 764 and 765, Top Section.....	4.00
Bottom Section .....	6.50
Fig. 1055 .....	5.00
Wind Mill Force Pumps, Figs. 422 and 423, No. 1....	4.75
No. 2.....	5.25
Fig. 401 .....	6.50
Fig. 402, Top Section.....	2.40
Bottom Section .....	3.60
Fig. 413 .....	6.00



### Bases and Bottom Caps.

Cistern Pumps, Figs. 198, 199, 200, 201 and 210,		Well Force Pumps, Fig. 240.....	\$1.50
Bases, Nos. 0, 1 and 2.....	\$0.75	Fig. 1021.....	.75
No. 3 .....	.85	Wind Mill Pump, Fig. 413.....	2.00
Nos. 4 and 5.....	1.00	Fig. 1056.....	1.00
No. 6 .....	1.25	Wind Mill Working Heads, Figs. 685 and 690, Bases..	2.00
No. 8.....	1.75	“Pacific” Force Pumps, Fig. 674, Bases, Nos. 2	
Figs. 202½ and 1051, Bottom Caps, Nos. 0, 1, 2, 3		and 4.....	2.00
and 4.....	.50	Nos. 6 and 8.....	2.25
Nos. 5 and 6.....	.75	Fig. 601, Bottom Caps, Nos. 2 and 4.....	.75
No. 8.....	1.00	Nos. 6 and 8.....	1.25
Pitcher Pumps, Figs. 205, 205½, 923 and 209, Bases,		“Pacific” Force Pumps, Double-Acting, Figs. 840	
No. 1.....	1.00	and 878, Bases, No. 2.....	2.75
No. 2.....	1.10	No. 4.....	3.00
No. 3.....	1.25	No. 6.....	3.50
No. 4.....	1.50	No. 8.....	5.00
No. 5.....	1.75	Fig. 841, Bottom Caps, No. 2.....	1.75
Ditto, for Brass Valve Seats, No. 1.....	.80	No. 4.....	2.00
No. 2.....	.90	No. 6.....	2.50
No. 3.....	1.00	No. 8.....	3.00
No. 4.....	1.15	House Force Pumps, Figs. 390, 392, 394 and 398,	
No. 5.....	1.50	Bases, Nos. 0 and 2.....	1.10
Fig. 208, Vacuum Base, No. 1.....	1.60	No. 4.....	1.25
No. 2.....	1.75	No. 6.....	1.75
No. 3.....	2.00	No. 8.....	2.00
“Star” Well Pumps, Figs. 206, 207 and 845, Nos. 1		Figs. 391, 393, 395 and 399, Bottom Caps, Nos.	
and 2.....	.75	0, 2 and 4.....	.50
No. 3.....	.85	No. 6.....	.85
Nos. 4 and 5.....	1.00	No. 8.....	1.50
Yard Well Pumps, Fig. 227 .....	1.50	House Force Pumps, Figs. 440, 441, 442, 281, 480, 481,	
Fig. 1020.....	.75	712, 713, 714, 449, Bottom Caps, Nos. 0, 2, 3	
		and 4.....	1.00
		Nos. 5 and 6.....	1.25

House Force Pumps, Double-Acting, Figs. 271, 273, 450 and 452, Bottom Caps, Nos. 0, 1, 2, 3 and 4.....	\$1.50
No. 6.....	1.75
No. 8.....	2.25
No. 10.....	2.75
Figs. 876, 879, 875 and 877, Bottom Caps, No. 2,	1.50
No. 4.....	2.00
No. 6.....	2.50
No. 8.....	3.00

### Plungers, With Rods.

Cistern Pumps, Figs. 198, 199, 200, 201 and 202½—	
No. 0, 2 inch.....	\$0.70
No. 1, 2½ inch.....	.75
No. 2, 2½ inch.....	.80
No. 3, 2½ inch.....	.90
No. 4, 3 inch.....	1.00
No. 5, 3½ inch.....	1.15
No. 6, 3½ inch.....	1.30
No. 8, 4 inch.....	1.50
Figs. 210 and 1051—No. 0, 2 inch.....	1.20
No. 1, 2½ inch.....	1.25
No. 2, 2½ inch.....	1.30
No. 3, 2½ inch.....	1.40
No. 4, 3 inch.....	1.50
No. 5, 3½ inch.....	1.65
No. 6, 3½ inch.....	1.80
No. 8, 4 inch.....	2.00
Pitcher Pumps, Figs. 923, 205, 205½, 208 and 209—No.	
1, 2½ inch.....	.80
No. 2, 3 inch.....	1.00

No. 3, 3½ inch.....	\$1.30
No. 4, 4 inch.....	1.50
No. 5, 4½ inch.....	1.75

### Plungers Only, no Rods.

Well Lift and Force Pumps. See Cylinder Plungers  
Only, "A" style.

"Pacific" Force Pumps, Figs. 674 and 601—No. 2, 2½ inch.....	\$0.80
No. 4, 3 inch.....	1.00
No. 6, 3½ inch.....	1.30
No. 8, 4 inch.....	1.50
"Pacific" Force Pumps, Double-Acting, Figs. 840, 841 and 878—No. 2, 2½ inch.....	.75
No. 4, 3 inch.....	1.10
No. 6, 3½ inch.....	1.45
No. 8, 4 inch.....	1.80
House Force Pumps, Figs. 390 to 399—No. 0, 2 inch..	.70
No. 2, 2½ inch.....	.80
No. 4, 3 inch.....	1.00
No. 6, 3½ inch.....	1.30
No. 8, 4 inch.....	1.50
House Force Pumps, Figs. 440, 441, 442, 281, 480, 481, 712, 713, 714 and 449—No. 0, 2 inch.....	.75
No. 2, 2½ inch.....	.80
No. 3, 2½ inch.....	.90
No. 4, 3 inch.....	1.00
No. 5, 3½ inch.....	1.15
No. 6, 3½ inch.....	1.30
House Force Pumps, Double-Acting, Figs. 271, 273, 450, 452—Nos. 0, 1 and 2, 2, 2½ and 2½ inch..	.75
No. 3, 2½ inch.....	1.00

No. 4, 3 inch.....	\$1.10
No. 6, 3½ inch.....	1.45
No. 8, 4 inch.....	1.80
No. 10, 4½ inch.....	2.60
Figs. 876, 879, 875 and 877 — No. 2, 2½ inch.....	.75
No. 4, 3 inch.....	1.10
No. 6, 3½ inch.....	1.45
No. 8, 4 inch.....	1.80

### Lower Valves and Weights.

	2 to 3 in.	3¼ to 4 in.
Cistern Pumps.....	\$0.25	\$0.35
Pitcher Pumps.....	.25	.35
Well Lift and Force Pumps.....	.25	.35
"Pacific" Force Pumps, S. A.....	.25	.35
House Force Pumps.....	.25	.35
House Force Pumps, S. A.....	.25	.35
Figs. 271, 273, 450 and 452 — Nos. 0, 1, 2, 3 and 4.....		.75
Nos. 6, 8 and 10.....		1.05

### Lower Valve Leathers Only.

Cistern, Pitcher, etc.....	\$0.15	\$0.20
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### Lower Valve Weights and Screw.

Cistern, Pitcher, etc.....	\$0.10	\$0.15
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### Brass Valve Seats or Plates.

Cistern Pumps, Figs. 198, 199, 200, 201, 202½, 210 and 1051 — Nos. 0, 1, 2, 3 and 4, 2, 2½, 2½, 2½ and 3 inch.....	\$0.75
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No. 5, 3½ inch.....	\$1.00
No. 6, 3½ inch.....	1.25
No. 8, 4 inch.....	1.75
Pitcher Pumps, Figs. 205, 205½, 923 and 209 — No. 1, 2½ inch.....	.75
No. 2, 2½ inch.....	.90
No. 3, 2½ inch.....	1.10
No. 4, 3 inch.....	1.20
No. 5, 3½ inch.....	1.30

### Brass Valve Seat and Tube.

House Force Pumps, Figs. 390 to 399 — Nos. 0 and 2, 2 and 2½ inches.....	\$1.00
Nos. 4 and 6, 3 and 3½ inches.....	1.25
No. 8, 4 inch.....	1.50

### Brass Valve Plates.

House Force Pumps, Figs. 390 to 399 — Nos. 0, 2, 4, and 6, 2, 2½, 3 and 3½ inch.....	\$0.50
No. 8, 4 inch.....	.75
Ring Packing for Cylinders, 2 to 3 inch.....	.10
3½ to 4 inches.....	.15
Plunger Leathers, not crimped, 2 to 3 inch.....	.15
3½ to 4 inch.....	.20
Plunger Leathers, crimped, 2 to 2½ inch.....	.15
2½ inch.....	.20
3 inch.....	.25
3½ inch.....	.30
3½ inch.....	.35
3½ inch.....	.40
4 inch.....	.45

### Iron Cylinder Shells or Bodies.

Size, inches.....	2¼	2½	2¾	3	3¼	3½	3¾	4
Figs. 609 and 610 (Gas Set).....	\$1.50	\$1.60	\$1.80	\$2.00	\$2.25	\$2.50	\$2.80	\$3.25
Figs. 611 and 612 (Shallow Well).....	2.30	2.45	2.45	2.70	3.00	3.75	3.75	3.80
Figs. 613, 614 and 548 (Deep Well).....	2.80	3.05	3.30	3.55	3.80	4.05	4.15	4.30
Fig. 620 (Wood Pump).....	1.50	1.60	1.80	2.00	2.25	2.50	2.80	3.25
Fig. 559½ (Deep Well).....				2.70				3.80

### Cylinder Plungers only, no Rods.

Size, inches.....	2¼	2½	2¾	3	3¼	3½	3¾	4
"A" style (Gas Set).....	\$0.75	\$0.80	\$0.90	\$1.00	\$1.15	\$1.30	\$1.40	\$1.50
"B" style (Shallow Well).....	2.00	2.10	2.10	2.30	2.45	2.70	2.95	3.20
"C" style (Deep Well).....	2.30	2.45	2.70	2.95	3.20	3.45	3.60	3.95
"F" style (Wind Mill) Brass.....	1.90	2.00	2.15	2.25	2.40	2.60	2.85	3.10
"G" style (Wood Pump).....	.75	.80	.90	1.00	1.15	1.30	1.40	1.50
"H" style (Double-Acting).....	1.00	1.00	1.00	1.00	1.25	1.25	1.50	1.50

### Cylinder Attachments or Caps.

	Top.	Bottom.
Figs. 609, 610, 611, 612, 613, 614, 615½, 616, 616½ and 619, 2½, 2¾, 2¾ and 3 inch....	\$0.75	\$1.00
3½, 3¾, 3¾ and 4 inch.....	1.00	1.25

### Cylinder Lower Valves.

Figs. 609, 610, 611, 612, 613, 614, 615½, 616, 616½ and 619, 2½, 2¾, 2¾ and 3 inch .....	\$0.25
3½, 3¾, 3¾ and 4 inch.....	.35

### Piston or Connecting Rods.

Cistern Pumps, Figs. 198, 199, 200, 201 and 202½.....	\$0.15
Figs. 210 and 1051.....	.40
Pitcher Pumps, Figs. 923, 205, 205½, 208 and 209 —	
Nos. 1 to 3.....	.10
Nos. 4 and 5 .....	.15
Well Lift Pumps, Figs. 206, 207, 1018, 550, 551 and 847½ .....	.50
Fig. 227.....	.60
Figs. 1023, 845, 846, 849 and 486.....	.25

Well and Wind Mill Force Pumps, Polished Round Rods, Figs. 1019, 848½, 240, 1020, 1021, 852½, 882½, 424, 426, 854, 1052 and 1053.....	\$0.75
Figs. 850, 853, 883, 857, 422, 423, 401 and 402.....	.60
Deep Well Pumps, Polished Iron Rods, Figs. 236, 592, 237, 887, 593, 763, 764 and 765.....	.60
Well and Wind Mill Pumps, Long Flat Rods, Figs. 1039, 553, 1032, 1055 and 1056.....	.75
Figs. 762, 412 and 780.....	.60
Well and Wind Mill Force Pumps, Short Flat Rods, Figs. 424, 426, 764, 422, 423, 401, 402, 413 and 765.....	.50
Wind Mill Working Heads, Figs. 685 and 690, Short Flat Rods.....	.50
Brass Cased Round Rods.....	1.00
"Pacific" Force Pumps, Figs. 674 and 601, Short Flat Rods.....	.50
Brass Cased Rods—Nos. 2 and 4.....	1.00
No. 6.....	1.25
No. 8.....	1.75
"Pacific" Force Pumps, Double-Acting, Figs. 840 and 841, Short Flat Rods.....	.50
Brass Cased Rods—Nos. 2 and 4.....	1.00
No. 6.....	1.25
No. 8.....	1.75
House Force Pumps, Figs. 390 to 399, Brass Cased Rods—Nos. 0, 2 and 4.....	1.00
No. 6.....	1.25
No. 8.....	1.75
House Force Pumps, Figs. 440, 441, 442, 281, 480, 481, 712, 713, 714, 449, Brass Cased Rods—Nos. 0, 2, 3 and 4.....	1.00

Nos. 5 and 6.....	\$1.25
House Force Pumps, Double-Acting, Figs. 271, 273, 452, 450, 876, 879, 875, 877, Brass Cased Rods—Nos. 0, 1, 2, 3, and 4.....	1.00
No. 6.....	1.25
No. 8.....	1.75
No. 10.....	2.25

### Caps and Glands.

	Cap.	Gland.
Yard Well Pumps, Fig. 240.....	\$0.75	\$1.00
Fig. 1021.....	...	.50
Well Force Pumps, Figs. 852½, 882½, 424, 426, 854, 1052, 1053, 853, 883, 855 and 857. ....	...	1.00
Deep Well Pumps, Figs. 236, 592 and 764... ..	.50	...
Figs. 237 and 887.....	.75	.50
Figs. 593, 763 and 765.....	.90	.50
Wind Mill Force Pumps, Figs. 422, 423, 401, 402 and 413.....	...	1.00
Wind Mill Working Heads, Figs. 685 and 690, ...	...	1.00
"Pacific" Force Pumps, Figs. 674 and 601—		
Nos. 2 and 4.....	...	1.00
Nos. 6 and 8.....	...	1.25
"Pacific" Force Pumps, Double-Acting, Figs. 840, 841 and 878—Nos. 2 and 4.. ..	...	1.00
Nos. 6 and 8.....	...	1.25
House Force Pumps, Figs. 390 to 399—No. 0, ..	.50	.75
Nos. 2 and 4.....	.50	1.00
Nos. 6 and 8.....	.75	1.25
House Force Pumps, Figs. 440, 441, 442, 281, 480, 481, 712, 713, 714 and 449—Nos. 0, 2, 3 and 4.....	.65	1.00

No. 5.....	\$0.75	\$1.25
No. 6.....	1.00	1.25
House Force Pumps, Double-Acting, Figs. 271, 273, 452, 450—Nos. 0, 1, 2, 3 and 4, .65	1.00	1.00
No. 6 .....	1.00	1.25
Nos. 8 and 10 .....	1.25	1.25
Figs. 876, 879, 875 and 877—Nos. 2 and 4, ...	1.00	1.00
Nos. 6 and 8.....	...	1.25

### Brass Bowls.

House Force Pumps, Single and Double-Acting, Figs. 440, 441 .....	\$1.25	
House Force Pumps, Double-Acting, Figs. 271, 273, 452 and 450—Nos. 0, 1, 2, 3 and 4.....	1.25	
No. 6 .....	1.50	
Nos. 8 and 10 .....	1.75	

### Pitmans.

House Force Pumps, Single-Acting, Figs. 440, 441, 442 and 281.....	81.00	
Figs. 480 and 714.....	2.50	
House Force Pumps, Double-Acting, Figs. 271, 273, 452, 876, etc.....	1.00	

### Guides.

House Force Pumps, Single-Acting, Figs. 440, 441, 442, 714, etc.....	80.75	
House Force Pumps, Double-Acting, Figs. 271, 273, 452, 876, etc.—Nos. 0, 1, 2, 3 and 4.....	.75	
Nos. 6, 8 and 10.....	1.50	

### Guide Rods.

House Force Pumps, Single-Acting, Figs. 440, 441, 442, 714, etc.....	\$0.60	
House Force Pumps, Double-Acting, Figs. 271, 273, 452, 876, etc.—Nos. 0, 1, 2, 3 and 4.....	.60	
Nos. 6, 8 and 10.....	1.00	

### Cross Heads, including Nuts and Set Screws, and Links in Pair.

Cross Heads. Links.

Well Pumps, Figs. 848 $\frac{1}{2}$ , 240, 852 $\frac{1}{2}$ , 882 $\frac{1}{2}$ , 854, 1052, 853, 883, 855, 850 and 857.....	\$0.50	\$0.25
Deep Well Pumps, Figs. 592, 593 and 763....	.70	.40
House Force Pumps, Figs. 390 to 399—Nos. 0, 2 and 4.....	.50	.25
Nos. 6 and 8.....	.60	.30
Fig. 1019.....	.50	.25
Fig. 1020 .....	.35	.25
Fig. 1021 .....	.35	.25

### Air Chambers.

Well Force Pumps, Figs. 854, 855 and 857.....	\$3.00	
Fig. 240.....	3.50	
Deep Well Force Pumps, Figs. 237 and 887.....	3.50	
Figs. 593 and 763.....	4.00	
Wind Mill Force Pumps, Figs. 401, 402 and 413.....	3.00	
Fig. 765 .....	4.00	
"Pacific" Force Pumps, Figs. 674 and 601—Nos. 2 and 4.....	2.00	
Nos. 6 and 8.....	3.00	
"Pacific" Force Pumps, Double-Acting, Figs. 840, 841 and 878—No. 2.....	2.50	

No. 4.....	\$3.00
No. 6.....	4.00
No. 8.....	5.00
Wind Mill Working Heads, Figs. 685 and 690.....	5.00
House Force Pumps, Figs. 392 to 399—Nos. 0, 2 and 4, Nos. 6 and 8.....	2.00 3.00
House Force Pumps, Figs. 441, 442, 281, 713, 714 and 449—Nos. 0, 2, 3 and 4.....	2.00
Nos. 5 and 6.....	3.00
House Force Pumps, Double-Acting, Figs. 273, 452 and 450—Nos. 0, 1 and 2.....	2.00
Nos. 3 and 4.....	3.50
No. 6.....	5.00
No. 8.....	6.50
No. 10.....	8.00
House Force Pumps, Double-Acting, Figs. 876, 879, 875 and 877—No. 2.....	2.50
No. 4.....	3.00
No. 6.....	4.00
No. 8.....	5.00

#### **Bearer Links.**

Wind Mill Lift and Force Pumps, 6-inch stroke.....	\$0.50
10-inch stroke.....	.75
Figs. 764 and 765, 6-inch stroke.....	.75
10-inch stroke.....	1.00

#### **Spouts.**

Well Pumps, Figs. 852 $\frac{1}{2}$ , 424, 486, 236, 853 and 422...	\$0.50
Deep Well Pumps, Figs. 592 and 764.....	.75

#### **Cock Spouts.**

Figs. 882 $\frac{1}{2}$ , 426, 883, 423 and 413.....	\$2.50
Figs. 264, 674, 601, 840, 841, 273 and 876.....	2.00
Nos. 0, 1, 2, 3 and 4.....	2.00
Nos. 6, 8 and 10.....	3.00

#### **Braces.**

Well and Wind Mill Lift and Force Pumps.....	\$0.50
Deep Well Pumps, Figs. 236 and 237.....	.60
Figs. 592, 593, 764 and 765.....	.75

#### **Iron Pipe Nuts, for Cistern and Pitcher Pumps, Spout and Air Chamber Nuts.**

For 1 and 1 $\frac{1}{4}$ inch Pipe.....	\$0.35
For 1 $\frac{1}{2}$ -inch Pipe.....	.45
For 2-inch Pipe.....	.60

#### **Lead Pipe Nuts for Cistern and Pitcher Pumps.**

For 1 and 1 $\frac{1}{4}$ inch Pipe.....	\$0.25
For 1 $\frac{1}{2}$ -inch Pipe.....	.35
For 2-inch Pipe.....	.50

#### **Brass Tubes for Iron or Lead Pipe.**

For 1 and 1 $\frac{1}{4}$ inch Pipe.....	\$0.50
For 1 $\frac{1}{2}$ -inch Pipe.....	.75
For 2-inch Pipe.....	1.00

#### **Base Set Screws and Lever Bolts.**

Cistern and Pitcher Pumps.....	\$0.08
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# INDEX TO FIGURES.

FIG.	1-62.	PAGE.	FIG.	63-107.	PAGE.
1	Single Gate Valve.....	320	63	"Masson" Spray Nozzle with Stick Handle.....	260
2	Double Gate Valve.....	320	64	"Masson" Spray Nozzle with Extension.....	261
3	Double Gate Brass Hose Valve.....	320	65	Coupling for Hose and Iron Pipe.....	262
4	Single Gate Brass Hose Valve.....	320	66	Hosford Hose Pipe.....	318
5	Lunkenheimer Brass Globe Valve, Jenkin's Disk Pattern..	321	67	Connection for Hose and Iron Pipe.....	263
6	Lunkenheimer Brass Globe Valve.....	321	68	Forged Coupling for Wood Sucker Rod.....	90
7	Lunkenheimer Brass Straight Way Valve.....	321	69	"Calla" Spray Nozzle.....	262
9	Malleable Wood Rod Coupling.....	91	70	Brass Suction Pipe Strainer.....	263
11	Rope Swivel.....	301	71	Brass Suction Pipe Strainer.....	263
12	Brass Corporation Stop Cock, Iron Pipe.....	323	72	Brass Pipe Extension and Stop Cock.....	263
13	Sand and Clay Auger.....	299	76	Valve Rod for Artesian Pump.....	90
15	Clay Auger.....	299	77	Wood Sucker Rod and Coupling.....	90
16	Tubular Well Cylinder Shoe.....	295	78	Wind Mill Connecting Slide.....	94
21	Lifting and Holding Tongs.....	302	79	Metallic Lower Valve for Inside Attachment Cylinders....	81
22	Pipe Drift.....	299	80	Metallic Lower Valve for Outside Attachment Cylinders...	81
23	Sliding or Friction Tongs.....	302	81	"Seneca" Spray Nozzle.....	261
25	Casing Swivel.....	301	82	"Seneca" Spray Nozzle with Stick Handle.....	261
28	Lunkenheimer Brass Horizontal Check Valve.....	321	84	Wind Mill Forked Rod.....	94
30	Vacuum Gauge.....	319	85	Brass Stop Cock.....	262
30½	Pressure Gauge.....	319	86	Improved Double Hose Clamp.....	316
32	Earth and Sand Auger.....	299	87	Single Hose Spanner.....	317
33	Brass Sand Bucket or Pump.....	295	88	Double Hose Spanner.....	317
34	Water Relief Valve.....	319	89	Brass Hose Nipple.....	317
35	Expanded Ring Screw Coupling.....	316	90	Brass Hose Nipple.....	317
38	Ceiling and Floor Hangers.....	308	91	Underwriters Hose Pipe.....	318
39	Post Hanger.....	308	92	Siamese Coupling to divide one stream.....	313
40	Pillow Block.....	308	93	Siamese Coupling to unite two streams.....	313
41	Wall Box.....	308	94	Siamese Coupling with Gates to divide one stream.....	313
42	Flanged Faced Couplings.....	308	95	Siamese Coupling with Gates to unite two streams....	313
43	Balanced Iron Pulley.....	307	96	Single Hydrant Gate.....	313
44	Wood Split Pulley.....	307	97	Double Hydrant Gate.....	313
48	Bamboo Extension and Stop Cock.....	263	98	Brass Globe Valve, male and female.....	322
49	Brass Y Connection.....	263	99	Brass Angle Valve, male outlet.....	322
49½	Brass Y Connection.....	263	100	Brass Globe Valve, both ends male.....	322
51	"Cyclone" Spray Nozzle.....	262	101	Brass Angle Valve, both ends male.....	322
52	"Pacific Cyclone" Spray Nozzle.....	262	102	Brass Globe Valve with Bibb for Hose.....	322
55	"Vermorel" Spray Nozzle.....	261	103	Brass Angle Valve with Bibb for Hose.....	322
57	"Vermorel" Spray Nozzle with Lance.....	261	104	Brass Garden Hose Valve with upward discharge.....	322
58	Brass Hose Straps.....	316	105	Brass Garden Hose Valve with downward discharge.....	322
59	Brass Hose Clamp.....	316	106	Brass Angle Check Valve.....	323
62	"Masson" Spray Nozzle.....	260	107	Brass Horizontal Swinging Check Valve.....	323

FIG. 1-62.

PAGE.

FIG. 63-107.

PAGE.



FIG.	108-162.	PAGE.
108	Brass Angle Swinging Check Valve.....	323
109	Plain Brass Bibb for Lead Pipe.....	325
110	Brass Hose Bibb for Lead Pipe.....	325
111	Brass Compression Bibb for Lead Pipe.....	325
112	Brass Compression Hose Bibb for Lead Pipe.....	325
114	Brass Compression Stop for Iron Pipe.....	325
115	Brass Ball Cock, Iron Pipe.....	323
116	Brass Rain and Well Water Cock, Iron Pipe.....	323
117	Brass Lever Safety Valve, cross pattern .....	319
119	Plain Brass Oil Cup .....	326
120	Hinged Lid Brass Oil Cup .....	326
122	Tee Handle Brass Oil Cup.....	326
124	Tee Handle Brass Air Cock.....	326
125	Tee Handle Bibb Air Cock.....	326
128	Plain Lubricator .....	326
130	Brass Stop and Sight Feed Oilier.....	326
131	Brass Steam Cock, Tee Handle.....	324
132	Brass Steam Cock, Flat Head.....	324
133	Brass Steam Cock, Square Head.....	324
134	Brass Service Cock, Square Head.....	324
135	Brass Service Cock, Tee Handle.....	324
136	Brass Service Cock, Square Head.....	324
137	Brass Union Meter Cock .....	324
138	"Perfection" Drive Well Point.....	291
139	"Perfection" Tubular Well Point.....	291
140	Banner Drive Well Point .....	291
141	Well Point for Water Works.....	292
142	Brass Tubular Well Cylinder .....	293
143	Brass Lined Tubular Well Cylinder.....	293
144	Brass Lined Tubular Well Cylinder .....	293
145	Tubular Well Ball Plunger .....	294
146	Tubular Well Ball Check.....	294
147	Tubular Well Poppet Plunger .....	294
148	Tubular Well Poppet Check.....	294
149	Tubular Well Marcy Plunger .....	294
150	Tubular Well Marcy Check .....	294
151	Tubular Well "Perfection" Check .....	294
152	Tubular Well "Perfection" Two Leather Plunger .....	294
153	Tubular Well "Perfection" Four Leather Plunger.....	294
154	Tubular Well "Strait" Plunger .....	294
156	Tubular Well "Strait" Check with Oval Valve Seat.....	294
157	Tubular Well "Strait" Check with Dog Coupling .....	294
158	Tubular Well "Bremer" Check.....	294
159	Copper Tank Float .....	295
160	Turned Coupling .....	295
161	Special Tool Coupling.....	295
162	Lunkenheimer Lever Throttle Valve .....	321

FIG.

108-162.

PAGE.

FIG.	163-190.	PAGE.
163	Lunkenheimer Gate Valve.....	321
164	Paddy Drill .....	296, 297
165	Paddy Drill .....	296, 297
165½	Rotary Paddy Drill .....	296, 297
166	"Gopher" Drill.....	296, 297
167	Extension Paddy Drill.....	296, 297
168	Paddy Drill .....	296, 297
169	Round Drill for Ball or Bolt Valve .....	298
170	Twist Drill for Ball or Bolt Valve .....	298
171	Chisel Drill for Ball or Bolt Valve.....	298
171½	Pipe Lifting Clevis.....	301
172	Hydraulic "Z" Drill.....	298
172½	Wind Mill Tank Valve .....	94
173	Twist Drill with Leather Valve.....	298
173½	Pole Slip or Jar .....	305
174	Shallow Drill with Leather Valve .....	298
174½	Hand Swivel.....	305
175	Enlarging Drill.....	298
175½	Chain Swivel .....	305
176	Clay and Cobblestone Auger.....	299
176½	Tile Setter.....	305
177	Auger Head.....	299
178	Solid Cross Drill.....	299
178½	Ram's Horn .....	305
179	Taper Tap.....	299
179½	Stone Grapple .....	305
180	Taper Die .....	299
180½	Rod Lifter.....	304
181	Steel Drive Head.....	300
181½	Rope Hook .....	304
182	Drive Block .....	300
182½	Pipe Dog .....	304
183	Drive Block .....	300
183½	Automatic Pipe Grapple.....	304
184	Pipe Lift .....	299
184½	Standard Automatic Pipe Lifter and Holder.....	304
185	Drive Plate.....	300
185½	Pipe Lifter.....	304
186	Tubular Well Jar.....	300
186½	Babcock Pipe Lift and Holder.....	304
187	Eastern Steel Shoe.....	300
187½	Little's Automatic Pipe Holder.....	304
188	Western Steel Shoe.....	300
188½	Inside Pipe Puller.....	303
189	Water Swivel .....	301
189½	Rod Packing .....	303
190	Improved Casing Swivel.....	301

FIG.

163-190.

PAGE.

FIG.	190 $\frac{1}{4}$ -289.	PAGE.	FIG.	292-386.	PAGE.
190 $\frac{1}{4}$	Derrick Irons and Pins.....	303	292	Power Boiler Feed Pump.....	238
191	Blind or Check Valve.....	301	297	Rotary Force Pump.....	161
191 $\frac{1}{4}$	Pulley Hooks.....	303	297 $\frac{1}{4}$	Large Rotary Force Pump.....	161
192	Blind or Check Valve.....	301	298	Power Rotary Force Pump.....	164
192 $\frac{1}{4}$	Outside Pipe Puller.....	303	301	Power Rotary Force Pump.....	168
194	Hydraulic and Jetting Swivel.....	301	302	Power Rotary Force Pump.....	169
194 $\frac{1}{4}$	Spring Grab.....	302	302 $\frac{1}{4}$	Power Rotary Fire Pump.....	171
195	End Pipe Reamer.....	302	304	Garden or Fire Engine.....	264
195 $\frac{1}{4}$	Friction Grab.....	302	305	Bemis & Call Combination Pipe Wrench.....	328
196	Pulley Blocks.....	302	307	Kirk's Pipe Wrench.....	328
196 $\frac{1}{4}$	Strainer Grab.....	302	308	Malleable Hinged Vise.....	330
197	Drive Top.....	302	309	Garden or Fire Engine, Side Suction.....	264
197 $\frac{1}{4}$	Valve Grab.....	302	310	Hill's Pipe Stock and Die.....	329
198	Cistern Suction Pump, Screw Base.....	17	311	Gas Pipe Tap.....	329
199	Cistern Suction Pump, Bolted Flat Base.....	18	312	Gas Pipe Reamer.....	329
200	Cistern Suction Pump, Bolted High Base.....	18	313	Combination Drill Reamer and Tap.....	329
201	Cistern Suction Pump, Large Pattern.....	19	314	Lightning Die and Holder, Single.....	330
202 $\frac{1}{4}$	Cistern Suction Pump on Brackets.....	19	315	Lightning Die and Holder, Double.....	330
205	Pitcher Spout Suction Pump, Open Top.....	22	316	Saunders' Pipe Cutter.....	328
205 $\frac{1}{4}$	Pitcher Spout Suction Pump, Closed Top.....	22	317	Barnes' Pipe Cutter.....	328
206	"Star" Well Lift Pump, Cast Set.....	25	320	Brass Ale or Beer Pump.....	243
207	"Star" Well Lift Pump, Wrought Set.....	25	322	Plumbers' Brass Force Pump.....	242
208	Pitcher Spout Suction Pump, Vacuum Base.....	23	323	Gas Companies' and Plumbers' Drip Pump.....	243
209	Pitcher Spout Suction Pump, Closed Spout.....	23	338	"Star" D. A. Railroad Force Pump, with Brake.....	79
210	Cistern Suction Pump, Double Rod.....	20	339	"Star" D. A. Railroad Force Pump, for Power.....	79
211	Howard's Combination Bench Vise.....	330	345	Hydraulic Ram.....	276
216	W. M. Force Pump Packing Box Head.....	70	345 $\frac{1}{4}$	Hydraulic Ram.....	276
217	W. M. Force Pump Packing Box Head.....	70	346	Double Hydraulic Ram.....	276
219	Sand Catcher.....	298	346 $\frac{1}{4}$	Hydraulic Ram.....	276
222	Suction Pipe Strainer with Rest.....	92	347	Iron Column Curb for Chain Pump.....	283
227	Well Lift Pump, Cast Set.....	30	350	Hydraulic Air Chamber.....	93
232	Malleable Rod Coupling.....	91	353	Large Steel Amalgam Bell.....	282
236	Deep Well Lift Pump Standard, Tight Top.....	48	357	"Gem" Graduating Spray Nozzle.....	316
237	Deep Well Force Pump Standard.....	51	362	Stillson's Pipe Wrench.....	328
240	Well Force Pump, Cast Set.....	30	366	Sink Coupling for Iron Pipe.....	288
264	Well Force Pump with Cock Spout.....	34	368	Sink Bolt.....	288
265	W. M. Well Force Pump with Check Valve.....	74	369	Stable Cess Pool.....	288
266	W. M. Well Force Pump with Air Chamber.....	74	370	Brock's Chain Tongs.....	327
271	D. A. House Force Pump with Check Valve.....	132	372	Gas Pipe Stock and Die.....	329
273	D. A. House Force Pump with Air Chamber and Cock Spout.....	132	373	Common Pipe Tongs.....	327
279	House Force Pump with Pitman for Power.....	137	374	Clark's Pipe Vise.....	330
280	Power Gas or Air Pump.....	244	375	Engineers' Wrench.....	327
281	House Force Pump with Spout Air Chamber.....	128	377	Brown's Adjustable Pipe Tongs.....	327
283	Two-Cylinder Force Pump.....	156	379	Wrought-Iron Press Screw.....	284
284	Two-Cylinder Force Pump with Folding Brakes.....	156	383	Wrought-Iron Jack Screw.....	284
285	Two-Cylinder Force Pump with Folding Brakes.....	157	385	Cast-Iron Jack Screw.....	284
289	Hand Boiler Feed Pump on Plank.....	236	386	Wrought-Iron Press Screw.....	284
FIG.	190 $\frac{1}{4}$ -289.	PAGE.	FIG.	292-386.	PAGE.

FIG.	390-465.	PAGE.
390	House Force Pump with Check Valve, on Base.....	119
391	House Force Pump with Check Valve, on Plank.....	119
392	House Force Pump with Air Chamber, on Base.....	120
393	House Force Pump with Air Chamber, on Plank.....	120
394	House Force Pump with Air Chamber and Cock, on Base..	121
395	House Force Pump with Air Chamber and Cock, on Plank,	121
398	House Force Pump with Air Chamber, on Base.....	122
399	House Force Pump with Air Chamber, on Plank.....	122
401	"Star" W. M. Force Pump Standard.....	64
402	"Star" W. M. Force Pump Standard.....	64
403	Sewer Trap.....	287
407	Goose Neck or Spout.....	93
408	Brass Rough Stop, Tee Handle.....	323
412	"Star" W. M. Lift Pump Standard.....	60
413	"Southern" W. M. Force Pump Standard.....	65
415	Round Corner Sink.....	286
416	Sewer Trap and Slop Sink.....	287
417	Cellar Trap.....	288
418	Half Circle Sink.....	286
419	Slop Sink.....	286
420	Hydrant Cess Pool.....	287
421	Hydrant Cess Pool with Bell Trap.....	287
422	"New Star" W. M. Force Pump Standard.....	63
423	"New Star" W. M. Force Pump Standard with Cock Spout,	63
424	"New Star" Well Force Pump.....	33
426	"New Star" Well Force Pump with Cock Spout.....	33
428	Plumbers' Square Sink.....	285
429	Corner Sink.....	286
430	Burrall's Iron Corn Sheller.....	283
431	Burrall's Iron Sheller Pieces.....	283
434	Sink Coupling for Lead Pipe.....	288
435	Sink Strainer.....	288
440	House Force Pump with Check Valve.....	127
441	House Force Pump with Air Chamber.....	127
442	House Force Pump with Air Chamber and Cock Spout.....	128
444	Molasses or Hot Liquid Pump.....	21
446	Artesian Well Working Head.....	71
448	Wind Mill D. A. Well Force Pump.....	75
449	House Force Pump with Crank Shaft and Fly-Wheel.....	133
450	D. A. House Force Pump with Crank Shaft and Fly-Wheel,	133
452	D. A. House Force Pump with Pitman for Power.....	131
456	Garden or Fire Engine.....	267
457	Two-Cylinder Power Force Pump.....	136
459	Brass Air Pump.....	245
460	Plano Style Fire Engine.....	270
464	Rotary Barrel Force Pump.....	163
465	Swan-Neck Village Fire Engine.....	268
FIG.	390-465.	PAGE.

FIG.	470-559½.	PAGE.
470	"Challenge" D. A. Force Pump.....	148
471	Suction Pipe Foot Valve and Strainer.....	92
473	Suction Pipe Foot Valve and Strainer.....	92
475	Suction Pipe Foot Valve and Strainer.....	92
476	Vertical Check Valve.....	92
480	House Force Pump with Check Valve.....	129
481	House Force Pump with Check Valve.....	129
482	Power Boiler Feed Pump.....	237
484	Power Boiler Feed Pump.....	237
485	Power Boiler Feed Pump.....	238
486	Well Lift Pump Standard, Open Top.....	47
487	Hydraulic Air Chamber.....	93
488	Hydraulic Air Chamber.....	93
489	Hydraulic Air Chamber.....	93
490	Lever Handle Cock Spout.....	93
492	Goose Neck or Spout.....	93
493	Goose Neck or Spout.....	93
494	"Challenge" D. A. Force Pump.....	147
495	Hand Boiler Feed Pump on Base.....	236
496	Large Hose Pipe, Screw Tip.....	318
497	Brass Hose Coupling.....	316
499	Hose Pipe, Screw Tip.....	318
501	Hose Pipe with Cock on End.....	318
502	Hose Nozzle, to tie on.....	318
503	Brass Hose Pipe Sprinkler.....	317
504	Brass Hose Couplings.....	316
510	Malleable Drive Cap.....	300
514½	"Syphon" W. M. Well Force Pump.....	76
515	Well Rod Joint and Brass Bush.....	91
516	Roller Guide for Well Rod.....	91
518	Two-Cylinder Force Pump, Wood Levers.....	158
520	Two-Cylinder Force Pump, Wrought-Iron Extension Levers,	158
524	Brass Jacket Drive Well Point.....	289
524½	Open End Well Point Extension.....	290
526½	Single Barrel Pump.....	113
527½	Double Barrel Pump.....	113
530	Factory Hose Cart.....	271
539	Village Fire Engine.....	269
542	Balanced Hose Cart.....	271
547	Manual Pumping Apparatus for Deep Wells.....	53
547½	Manual and Power Pumping Apparatus for Deep Wells...	54
548	Deep Well Pump Cylinder with Air Chamber.....	83
550	"New Star" Well Lift Pump, Open Top.....	27
551	"New Star" Well Lift Pump, Open Top.....	27
553	"New Star" Well Lift Pump, Tight Top.....	29
559	Well Lift Pump Standard and Cylinder.....	47
559½	Deep Well Pump Cylinder with Air Chamber.....	83
FIG.	470-559½.	PAGE.

FIG.	561½-653.	PAGE.	FIG.	655-760.	PAGE.
561½	Portable Brass Force Pump.....	259	655	House Force Pump on Wood Frame.....	136
562	"Challenge" Double-Acting Force Pump.....	148	656	Wind Mill Tank Valve.....	94
567	Brass Angle Valve.....	322	657	Wind Mill Tank Valve.....	94
568	Brass Cross Valve.....	322	658	Suction Pipe Strainer.....	92
572	Brass Vertical Check Valve.....	323	659	Suction Pipe Strainer.....	92
573	Plain Brass Bibb for Iron Pipe.....	325	660	Suction Pipe Strainer.....	92
574	Brass Compression Hose Bibb for Iron Pipe.....	325	661	Drive Well Washer Point.....	292
575	Rough Brass Stop, Lever Handle.....	325	662	Brass Jacket Tubular Well Point.....	290
578	Ship's Main and Bilge Pump, Wood Levers.....	159	665	Rotary Force Pump.....	164
579	Ship's Main and Bilge Pump, Wrought-Iron Extension Levers.....	159	667	Vertical Check Valve.....	92
581	"Monitor" D. A. Suction Pump.....	149	674	"Pacific" Wind Mill Force Pump.....	72
582	"Monitor" Combined Bilge and Force Pump.....	149	685	Wind Mill Force Pump Working Head.....	70
589	Power Pumping Apparatus for Deep Wells.....	55	687	"Royal" Steam Boiler Feed Pump.....	239
592	Deep Well Lift Pump Standard.....	48	688	"Royal" Steam Boiler Feed Pump, with Extension for Wells.....	240
593	Deep Well Force Pump Standard.....	52	690	Wind Mill Force Pump Working Head.....	70
597	Strong Pony or One-horse Power.....	110	694	Vertical Submerged Centrifugal Pump.....	176
597½	Heavy Iron Horse Power.....	111	695	Horizontal Centrifugal Pump.....	177
601	"Pacific" W. M. Force Pump on Brackets.....	72	696	Horizontal Centrifugal Pump, with Primer.....	177
604	"Challenge" D. A. Force Pump with Pitman for Power.....	151	703	Vertical Power Force Pump.....	235
605	Air Compressor or Vacuum Pump with Pitman for Power.....	246	707	Wind Mill Force Pump Packing Box Head.....	70
607	"Southern Star" Suction Pump.....	24	711	Overhead Counter-Shaft.....	137
608	"Southern Star" Force Pump.....	24	712	House Force Pump, with Crank Shaft and Fly-Wheel.....	130
609	Gas Set Pump Cylinder, Screw Attachment.....	82, 84	713	House Force Pump, with Crank Shaft and Fly-Wheel.....	130
610	Gas Set Pump Cylinder, Bolt Attachment.....	82	714	House Force Pump, with Pitman for Power.....	131
611	Shallow Well Pump Cylinder, Outside Attachment.....	82, 84	718	Well Frame and Double Barrel Pump.....	116
612	Shallow Well Pump Cylinder, Inside Attachment.....	82	720	Horse Gear and Double Barrel Pump.....	117
613	Deep Well Pump Cylinder, Outside Attachment.....	82, 84	723	Brass Compression Bibb for Iron Pipe.....	325
614	Deep Well Pump Cylinder, Inside Attachment.....	82	724	Brass Hose Bibb for Iron Pipe.....	325
615½	Deep Well Pump Cylinder, Outside Attachment.....	83	725	Brass Steam Cock, Square Head.....	324
616	Brass Pump Cylinders, Outside Attachment.....	85, 86	726	Brass Three-Way Cock.....	324
616½	Brass Pump Cylinder, Inside Attachment.....	85, 86	727	Brass Service Cock, Flat Head.....	324
619	Brass Pump Cylinder, Inside Attachment.....	87	728	Tubular Well Cylinder.....	293
620	Wood Pump Cylinder.....	83	729	Sand Pump and Drill combined.....	298
621	Double-Acting Pump Cylinder.....	83	732	Smith's Combination Bench Vise.....	330
622	Globe Suction Basket, to tie on.....	317	742	Horizontal Check Valve.....	92
624	Deep Well Pump Cylinder.....	87	747	"Alert" Double-Acting Force Pump.....	147
630	Double-Acting Garden or Fire Engine.....	266	750	Brass Suction Basket, to tie on.....	317
640	Hand Garden Force Pump.....	267	751	Brass Suction Basket, to screw on.....	317
642½	Portable Brass Force Pump.....	259	752	Brass Horizontal Check Valve.....	323
646	"Star" Yard Hydrant.....	280	753	Brass Globe Valve.....	322
647	"Star" Street Washer.....	280	754	Brass Hydrant Cock, Check and Waste.....	323
648	"Star" Wall Hydrant and Washer.....	281	755	Robbin's Chain Tongs.....	327
649	Adjustable Curb Boxes.....	281	756	Baxter's Adjustable Wrench.....	328
650	Geared Driving Shaft.....	102, 139	757	Pump Stock and Die.....	330
650½	Geared Driving Shaft.....	138	758	Steel Amalgam Bell.....	289
653	D. A. Garden or Fire Engine.....	266	760	Suction Pipe Foot Valve and Strainer.....	92
FIG.	561½-653.	PAGE.	FIG.	655-760.	PAGE.

FIG.	762-867.	PAGE.
762	"New Star" W. M. Lift Pump Standard .....	59
763	Deep Well Force Pump Standard, Brake Top .....	52
764	Wind Mill Well Lift Pump Standard .....	62
765	Wind Mill Deep Well Force Pump Standard .....	65
766	Union Hand Fire Engine .....	265
771	Malleable Pipe Coupling with Guide .....	91
772	Air Compressor or Vacuum Pump with Brake Top .....	246
773	Brass Two-Cylinder Force Pump .....	150
774	"Challenge" D. A. Force Pump on Truck .....	151
776½	"Syphon" Wind Mill Well Force Pump .....	76
780	Wind Mill Lift Pump Standard, Adjustable Stroke .....	62
782	Alligator Wrench .....	327
784	Brass Hose Cap .....	317
785½	"Alert" Double-Acting Power Pump .....	178
789	Hydraulic Test Pump .....	242
790	Combined Horse Power and "Challenge" Pump .....	107
799	Brass Hose Reducer .....	317
811	"Crescent" Yard Hydrant .....	278
812	"Crescent" Street Washer .....	278
813	"Crescent" Yard Hydrant .....	279
814	Adjustable Sink Bracket .....	285
815	Wind Mill Force Pump Working Head .....	70
817	D. A. Air Compressor, Vacuum and Water Pump .....	179
819	Power Rotary Force Pump .....	162
821	Rotary Force Pump .....	162
824½	"Challenge" D. A. Power Pump .....	179
826	Suction Pipe Strainer .....	92
827	Curb Block .....	281
829	"New Deluge" Suction Pump .....	152
835	Differential Power Working Head .....	98
836	"New Deluge" Suction Pump .....	152
840	"Pacific" D. A. Wind Mill Well Force Pump, on Base .....	73
841	"Pacific" D. A. Wind Mill Well Force Pump, on Brackets .....	73
845	"Star" Well Lift Pump Standard .....	45
846	"New Star" Well Lift Pump Standard, Open Top .....	45
847½	"New Star" Well Lift Pump, Bowl Top .....	28
848½	"New Star" Well Lift Pump, Tight Top .....	28
849	"New Star" Well Lift Pump Standard, Bowl Top .....	46
850	"New Star" Well Lift Pump Standard, Tight Top .....	46
852½	"New Star" Well Force Pump .....	32
853	"New Star" Well Force Pump Standard .....	49
854	Well Force Pump .....	34
855	"Northern Star" Well Force Pump Standard .....	50
857	"Star" Well Force Pump Standard .....	50
860	"Crescent" Yard Hydrant .....	278
861	"Crescent" Street Washer .....	278
867	Hydraulic Pressure or Test Pump .....	241
FIG.	762-867.	PAGE.

FIG.	868-941.	PAGE.
868	"New Deluge" Suction Pump .....	153
871	"New Deluge" Power Suction Pump .....	153
872	Manual and Power Pumping Apparatus for Deep Wells ..	53
875	D. A. House Force Pump with Brake Top .....	135
876	D. A. House Force Pump .....	134
877	D. A. House Force Pump with Crank Shaft and Fly- Wheel .....	135
878	"Pacific" Wind Mill D. A. Well Force Pump .....	75
879	D. A. House Force Pump with Pitman for Power .....	134
881	Vertical Power Force Pump .....	235
882½	"New Star" Well Force Pump with Cock Spout .....	32
883	"New Star" Well Force Pump Standard with Cock Spout ..	49
884	Strong Pony or One-Horse Gear Pumping Apparatus .....	110
885	Heavy Horse Gear Pumping Apparatus .....	111
887	Deep Well Force Pump Standard .....	51
888	Manual and Power Pumping Apparatus for Deep Wells ..	55
889	Power Pumping Apparatus for Deep Wells .....	54
893	Brass Air Pump with Crank Shaft and Fly-Wheel .....	245
894	Horse Gear Pumping Apparatus .....	112
895	Power Rotary Fire Pump with Frictional Gearing .....	173
896	Power Rotary Fire Pump .....	172
898	House Force Pump with Crank Shaft and Fly-Wheel .....	125
899	House Force Pump with Crank Shaft and Fly-Wheel .....	125
901	Roller Guide and Coupling .....	91
904	Brass Artesian Deep Well Pump .....	88, 89
905	Standard D. A. Spray Pump .....	252
905½	Standard D. A. Spray Pump with Air Chamber .....	253
906	"Ever Ready" Wind Mill Force Pump .....	97
914	Double Geared Horse Power .....	108
915	Combined Double Geared Horse Power and Triplex Power Pump .....	109
920	Triplex Power Water Works Pump .....	230, 231
922	"Magic" Ham Curing Pump .....	243
923	"Duke" Pitcher Spout Suction Pump .....	21
924	Triplex Power Pump .....	189
926	Triplex Electric Power Pump .....	220, 221
927	Brass Nickeled Basin Pump .....	126
928	"Lightning" Air Pressure Pump .....	248
932	Triplex Electric Power Pump .....	216
932A	Triplex Pump Belt Tightener .....	217
934	Triplex Electric Power Pump .....	223
935	Duplex Water Lifter .....	142
936	Duplex Brass Water Lifter .....	141
937	Duplex Hydraulic Ammonia Pump .....	143
938	Double-Acting House Force Pump with Crank Shaft and Fly-Wheel .....	124
941	High Service Pressure or Test Pump .....	241
FIG.	868-941.	PAGE.

FIG.	943-1020.	PAGE.
943	Swivel Hose Coupling.....	279
944	Special Rotary Force Pump.....	163
947	Triplex Power Suction Pump.....	202
948	Triplex Power Pump for Semi-Fluids.....	210
953	"Allabout" House Force Pump.....	123
954	"Allabout" House Force Pump with Cock Spout.....	123
956	Triplex Power Suction Pump.....	203
957	Triplex Power Water Supply Pump.....	187
963	"Sentinel" D. A. Spray Pump.....	257
965	Semi-Rotary "Clock" Force Pump.....	165
966	Horizontal Triplex Electric Mine Pump.....	227
967A	Gould Plunger.....	294
967B	Gould Check.....	294
968	Vertical Triplex Electric Mine Pump.....	225
969	Triplex Power Stuff Pump.....	205
971	Differential Power Working Head.....	99
973	"Allabout" House Force Pump with Air Chamber.....	124
975	Triplex Electric Power Pump.....	224
978	Differential Power Working Head.....	102
979	Artesian Well Working Head.....	71
982	Semi-Rotary "Clock" Force Pump.....	165
983	"Star" D. A. Spray Pump.....	254
985	Semi-Rotary "Clock" Spray Pump.....	255
989	"Handy" Knapsack Spray Pump.....	258
995	Semi-Rotary "Clock" Force Pump with Air Chamber.....	166
997	Triplex Power Pressure Pump.....	206
998	Semi-Rotary "Clock" Force Pump with Forked Welding Stub.....	166
999	Triplex Power Ammonia Pump.....	208
1000	Triplex Power Air Compressor and Vacuum Pump.....	212
1001	D. A. Railroad Force Pump with Brake.....	78
1002	D. A. Railroad Force Pump for Power.....	78
1003	Odorless Diaphragm Force Pump.....	154
1004	Double-Acting Power Pump.....	178
1007	W. M. Force Pump Packing Box Head.....	70
1008	Duplex Air Pressure Pump.....	247
1008½	D. A. Garden and Fire Engine.....	265
1009	Triplex Power Pump.....	191
1010	Triplex Power Pump.....	181
1011	Portable Brass Spray Pump.....	259
1012	Barrel Spray Cart.....	256
1013	Double Geared Driving Shaft.....	100, 101
1014	Differential Power Working Head.....	100, 101
1017	Triplex Power Pump for Semi-Fluids.....	211
1018	Well Lift Pump, Open Top.....	26
1019	Well Lift Pump, Tight Top.....	26
1020	Well Lift Pump, Pipe Standard.....	31
FIG.	943-1020.	PAGE.

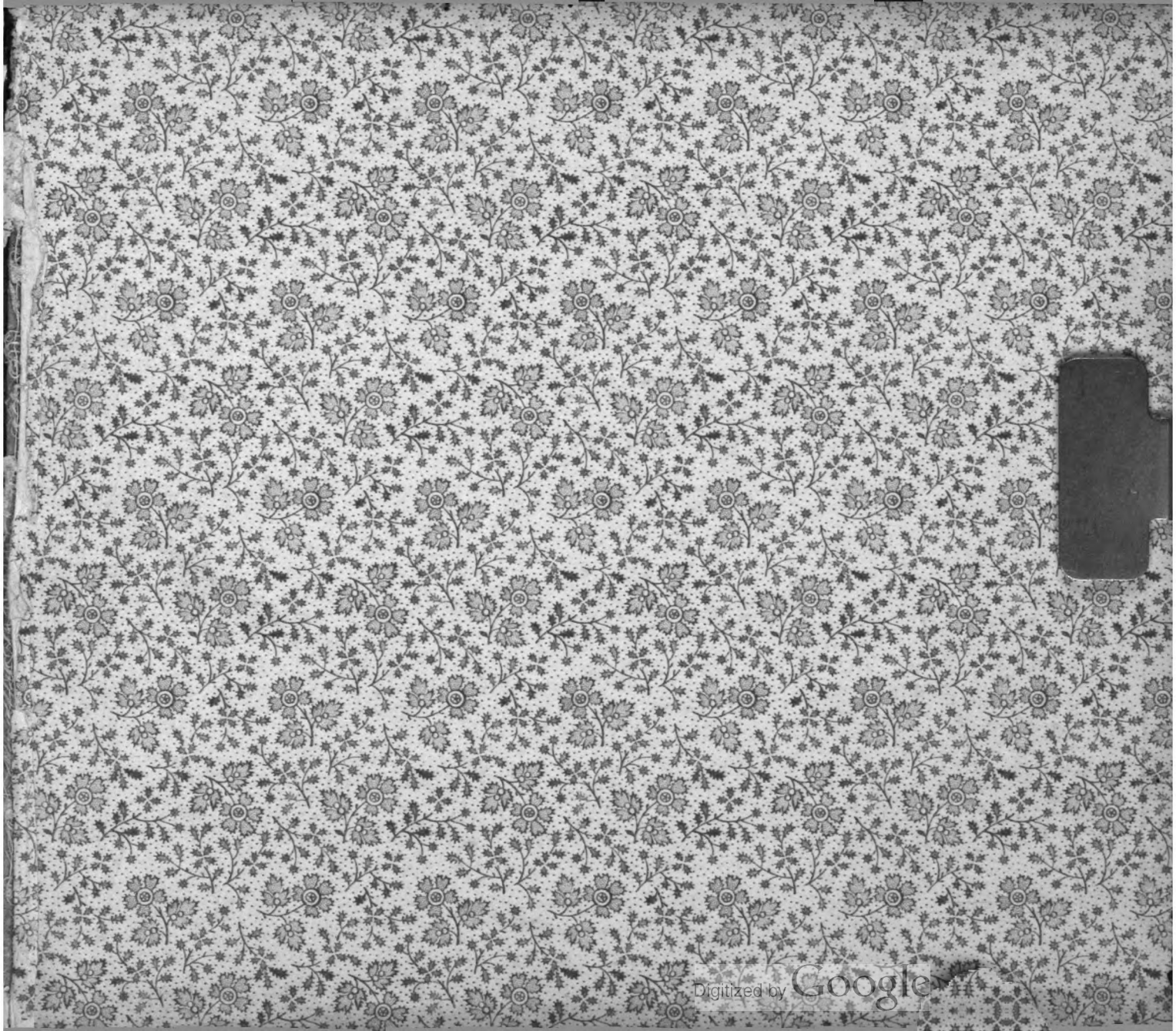
FIG.	1021-1069.	PAGE.
1021	Well Force Pump, Pipe Standard.....	31
1022	D. A. Suction or Vacuum Pump.....	198, 199
1023	New Well Lift Pump Standard, Open Top.....	44
1024	New Well Lift Pump Standard, Tight Top.....	44
1025	"Empire" D. A. Well Force Pump, Common Top.....	38
1026	"Empire" D. A. Well Force Pump, Wind Mill Top.....	39
1027	"Empire" D. A. Well Force Pump, Common Top and Three-way Cock.....	40
1028	"Empire" D. A. Well Force Pump, W. M. Top and Three-way Cock.....	41
1029	Power Air Pressure or Vacuum Pump.....	247
1030	Differential Power Working Head.....	97
1031	Anti-Freezing W. M. Force Pump Head.....	68
1032	W. M. Lift Pump Standard.....	60
1033	Anti-Freezing W. M. Force Pump Head.....	67
1034	Triplex Hydraulic Pressure Pump.....	207
1035	Plumbers' Brass Force Pump.....	242
1036	Diaphragm Suction Pump, Side Inlet.....	155
1037	Nickel-Plated Air Pressure Pump.....	249
1038	Diaphragm Suction Pump, Bottom Inlet.....	155
1039	Well Lift Pump, Tight Top.....	29
1040	"Crescent" Yard Hydrant.....	270
1043	"New Deluge" Power Suction Pump.....	154
1044	Brass House Force Pump.....	126
1045	Anti-Freezing W. M. Force Pump.....	67
1046	Pipe Saddle.....	94
1047	"Ever Ready" W. M. Well Force Pump.....	77
1048	Anti-Freezing W. M. Force Pump.....	68
1049	Double-Acting Suction or Vacuum Pump.....	200, 201
1050	Swivel Elbow Union.....	143
1051	Cistern Suction Pump, Double Rod and Brackets.....	20
1052	D. A. Well Force Pump, Common Top.....	35
1053	D. A. Well Force Pump, W. M. Top.....	35
1054	Brass House Force Pump.....	126
1055	W. M. Lift Pump Standard.....	61
1056	W. M. Lift Pump, Top and Base.....	61
1057	Artesian Steam Pumping Engine.....	102
1058	Triplex High Pressure Boiler Feed Pump.....	198
1059	Triplex Power Brine Pump.....	209
1061	W. M. Regulator Force Pump Head.....	69
1062	Geared Driving Shaft and Treble Barrel Pump.....	114, 115
1063	Nickel-Plated Air Pressure Pump.....	249
1064	Irrigation Pump Cylinder.....	87
1065	Gas Fitters' Proving Pump.....	244
1066	"Lightning" Air Pressure Pump with Pitman for Power, Compression Bibb.....	248
1067	Compression Bibb.....	98
1069	"Thresher" Tank Pump.....	150
FIG.	1021-1069.	PAGE.











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